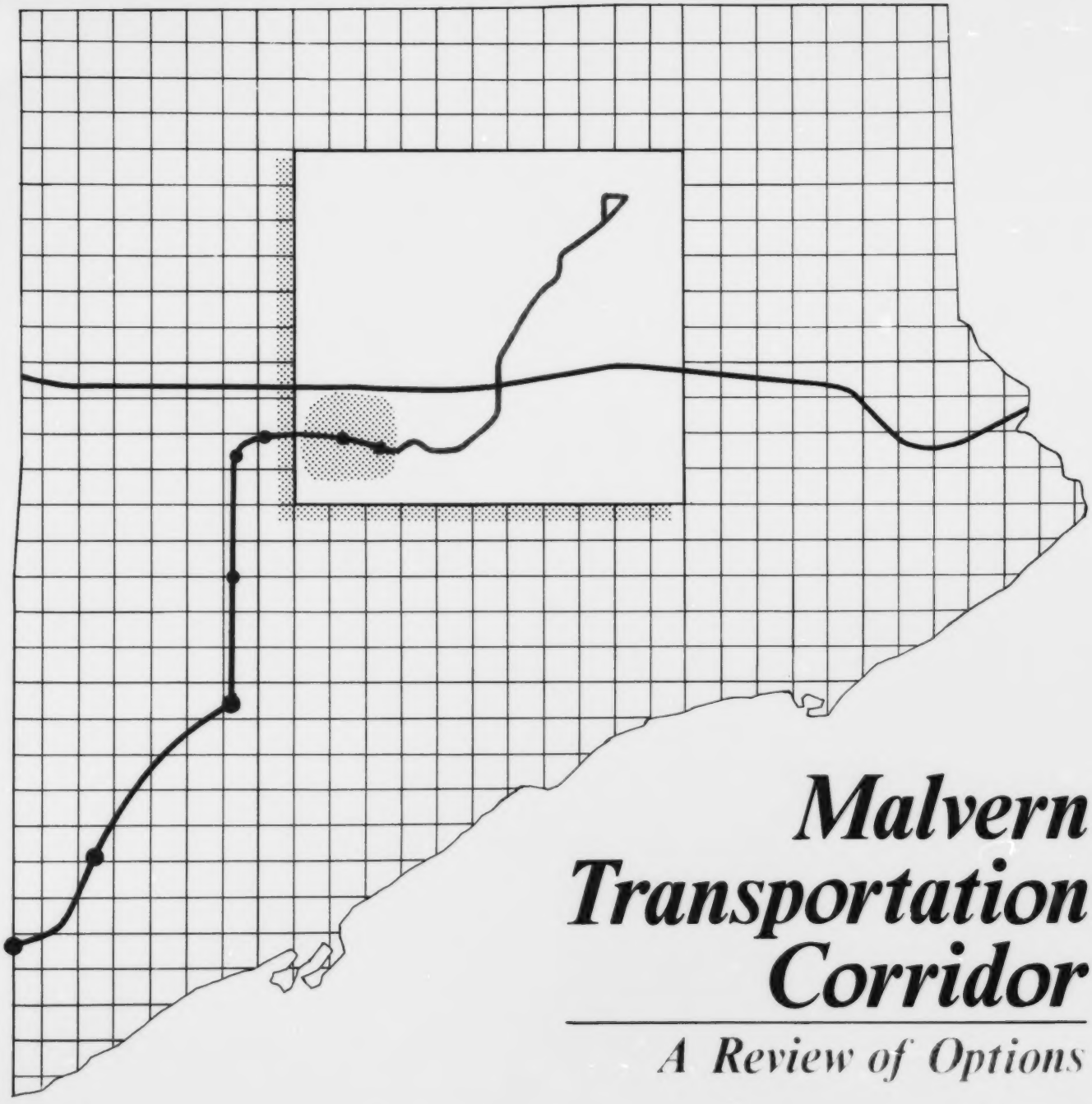

Malvern Transportation Corridor

A Review of Options

A Joint Report by:

METROPOLITAN TORONTO PLANNING DEPARTMENT
TORONTO TRANSIT COMMISSION
CITY OF SCARBOROUGH PLANNING DEPARTMENT
MINISTRY OF TRANSPORTATION AND COMMUNICATIONS

October 1986

MALVERN TRANSPORTATION CORRIDOR

- A REVIEW OF OPTIONS -

OCTOBER, 1986

A joint study by:
Metropolitan Toronto Planning Department;
Toronto Transit Commission;
Scarborough Planning Department;
Ministry of Transportation and Communications

MALVERN TRANSPORTATION CORRIDOR

- A REVIEW OF OPTIONS -

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MALVERN TRANSPORTATION CORRIDOR
- A REVIEW OF OPTIONS -

1.0 INTRODUCTION:

1.1 Background:

At its meeting of June 28, 1977, Metropolitan Council approved the construction of a Light Rail Transit (LRT) line from the Kennedy Subway station (under construction at the time) to the Scarborough City Centre. The Scarborough RT, as it is now known, opened in 1985 for service between Kennedy and McCowan Stations. During the feasibility study for this line, several options for possible future line extensions were examined, and an extension to the Malvern Community was considered to have the highest ranking when compared with extensions to other areas of Scarborough ("Priorities for Line Extension", December, 1975). Based on this analysis, an extension to Malvern was proposed in the "Metroplan Concept and Objectives", report (May, 1976) as one element of a proposed system of Intermediate Capacity Transit lines. The extension was supported by Scarborough Council in its response to the Metroplan proposals.

As a result of development pressures in the central part of the Malvern Community, it became necessary to select an alignment which could be protected and to suggest a land use configuration in the Malvern Centre that would support the line. Consequently, a study was undertaken by the Metropolitan and Scarborough Planning Departments entitled "Secondary Plan Study for Malvern Community, Central Area" (February 1977) which formed the basis for the Secondary Plan for the Malvern Central Area and established a preferred alignment for an LRT extension through the Malvern Central Area. A second study entitled "Light Rail Transit to Malvern - Evaluation of Alternative Alignments" was completed in April, 1979 by the Metro Planning Department, in co-operation with representatives of the Ministry of Transportation and Communications (M.T.C.), Toronto Transit Commission (T.T.C.) Scarborough Planning Department, Metro Roads and Traffic Department and Metro Property Department. This study

recommended an alignment between Scarborough City Centre and the Malvern Community which extends from the current terminus at McCowan Road, northeasterly to Finch Avenue west of Neilson Road, including the portion through the Malvern Central Area previously agreed upon, as indicated in Exhibit 1.1. The recommended alignment had the advantage that the majority of land was in the ownership of public agencies as outlined in Exhibit 1.2.

This preferred alignment was subsequently identified as the Malvern Transportation Corridor and designated in the Metropolitan Official Plan (Figure 7 and Section 6.G.2), and the Scarborough Official Plan. Section 6.G.2 of the Official Plan indicates that the Corridor is being protected for transit purposes and Figure 7 notes that public agencies have been requested to protect the right-of-way.

Two small sections of the Corridor are now in Metropolitan ownership, one being a short section between Highway 401 and Milner Avenue which was approved for acquisition by Metropolitan Council on December 9, 1980 (Clause No.9 of Report No.1 of the Metropolitan Executive Committee), to ensure that the development of the lands in private ownership on the east side of Markham Road (owned by "Roridan") did not preclude the protection of the Corridor. The second section is the former Hydro lands west of Bellamy Road, acquired in November, 1983 by Metro in conjunction with the acquisition of the site for the McCowan yard.

Over the past few years two major transit studies have been undertaken which have a direct bearing on the Malvern Corridor. The GO-ALRT Northern Section Study concluded that the portion of the Malvern Transportation Corridor south of Highway 401, together with the Highway 401 Corridor itself (east of the Corridor), would be the preferred route for a future inter-regional rapid transit service connecting the Region of Durham to the Scarborough City Centre. The GO-ALRT technology to have been developed by U.T.D.C. has since been abandoned, but the concept of such an inter-regional transit service still has potential in this area because of the

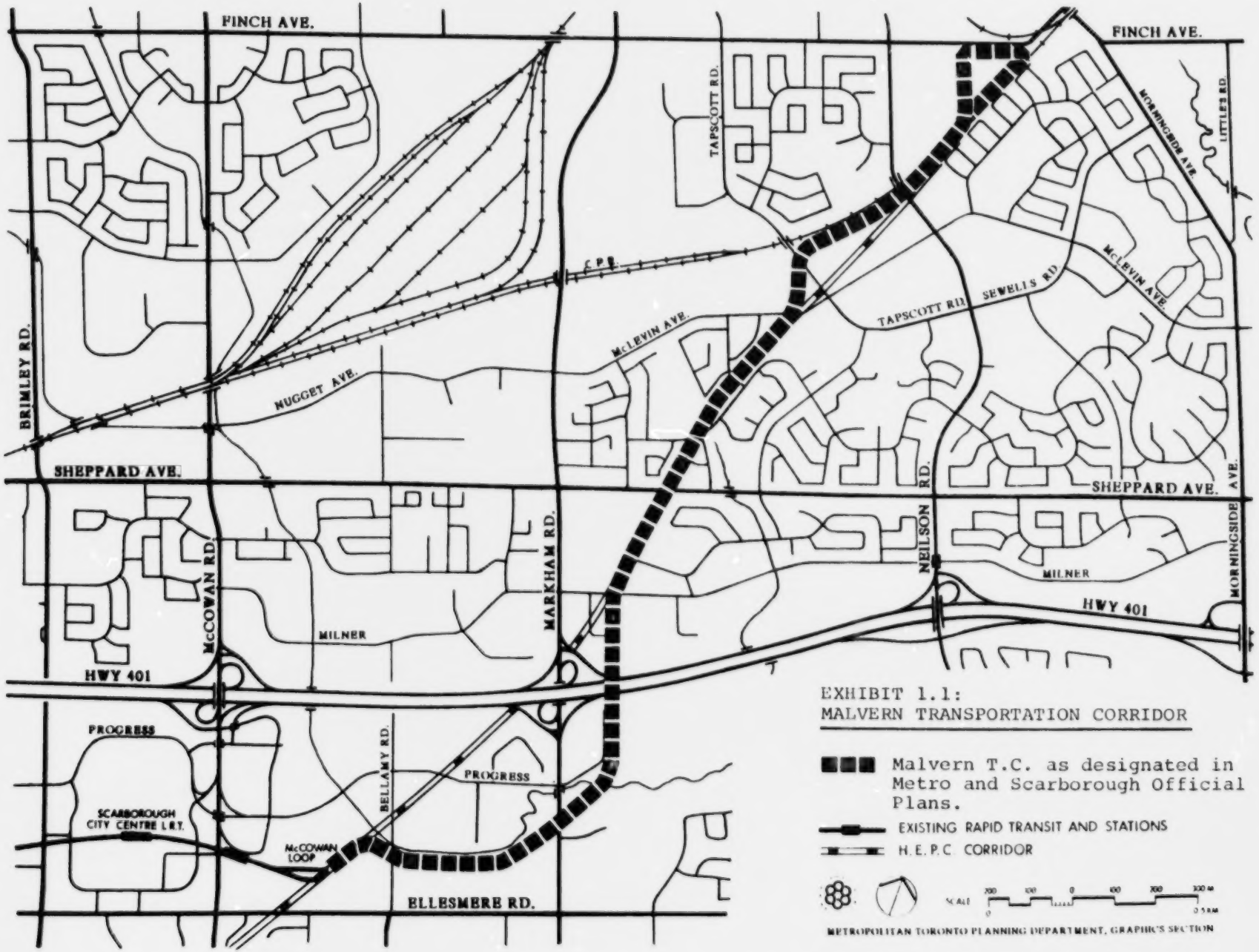


EXHIBIT 1.1:
MALVERN TRANSPORTATION CORRIDOR

Malvern T.C. as designated in Metro and Scarborough Official Plans.

EXISTING RAPID TRANSIT AND STATIONS

H.E.P.C. CORRIDOR

SCALE 200 100 0 400 800 1200 m
0 0.5 KM

METROPOLITAN TORONTO PLANNING DEPARTMENT, GRAPHICS SECTION

EXHIBIT 1.2

MALVERN TRANSPORTATION CORRIDOR OWNERSHIP IN 1979

Land Ownership	Number of Properties Affected	Area Required (sq. ft.)	% of Total Area Required
Private [1.]	5	353,500	19%
Public			
- Metro School Board	1	48,000	3%
- Ontario Hydro [1.]	2	384,000	20%
- City of Scarborough	2	198,000	10%
- Metro Conservation Auth.	1	40,000	2%
- Centennial College	1	66,000	4%
- Ontario Housing Corp. (including Yard Facility)	2	796,749	42%
Total Public	9	1,532,740	81%

Notes:

1. Metro have purchased, since 1979, a portion of the Private and Ontario Hydro lands.

Source:

Metropolitan Toronto Planning Department.
"Malvern Transportation Corridor - Protection of Right-of-Way", May, 14, 1979.

flexibility that the Highway 401 right-of-way east of Markham Road has for accommodating rapid transit. The joint Metropolitan/T.T.C. Network 2011 study concluded that an extension of the Scarborough RT line to Malvern was not warranted within the next 25 years due to the low forecast ridership. The Sheppard/Finch Transit Corridor Study Summary Report (May, 1985) concluded that service to Malvern could be provided by a program of staged bus improvements which ultimately could see the implementation of a grade separated busway.

Since then, there has been discussion within the M.T.C., at staff level only, of a concept of 'Gateways' into Metro, whereby commuters from outside Metro would be encouraged to use transit by improving access to the T.T.C. and GO Transit services. If the Scarborough RT were extended, a station in the vicinity of Highway 401 with park'n'ride and kiss'n'ride facilities, would have the potential to intercept commuters from Highway 401 and therefore function as one such 'Gateway'.

1.2 Rationale for the Review:

A considerable amount (about 20 per cent.) of the Corridor is composed of surplus Ontario Hydro lands which Hydro staff have been anxious to dispose of, but have not offered for sale at Metro's request. In March, 1986, Metro received correspondence from Ontario Hydro stating that they had bona fide offers from two private parties to purchase their lands north and south of Sheppard Avenue as shown on Exhibit 1.3. The deadline for comments was May 28, 1986. Since Metro had requested Ontario Hydro's co-operation and support in protecting the Corridor, they recognized Metropolitan Toronto's interest in these potential sales.

At about the same time, in response to the Network 2011 report, the City of Scarborough requested that "Metropolitan Toronto participate in a joint Metropolitan/Scarborough study of transit options for the Malvern Transit Corridor", such study to be completed within six months. The joint study of the Corridor was intended to re-examine the need to protect the Corridor in whole or in part, in light of the conclusions of the recently

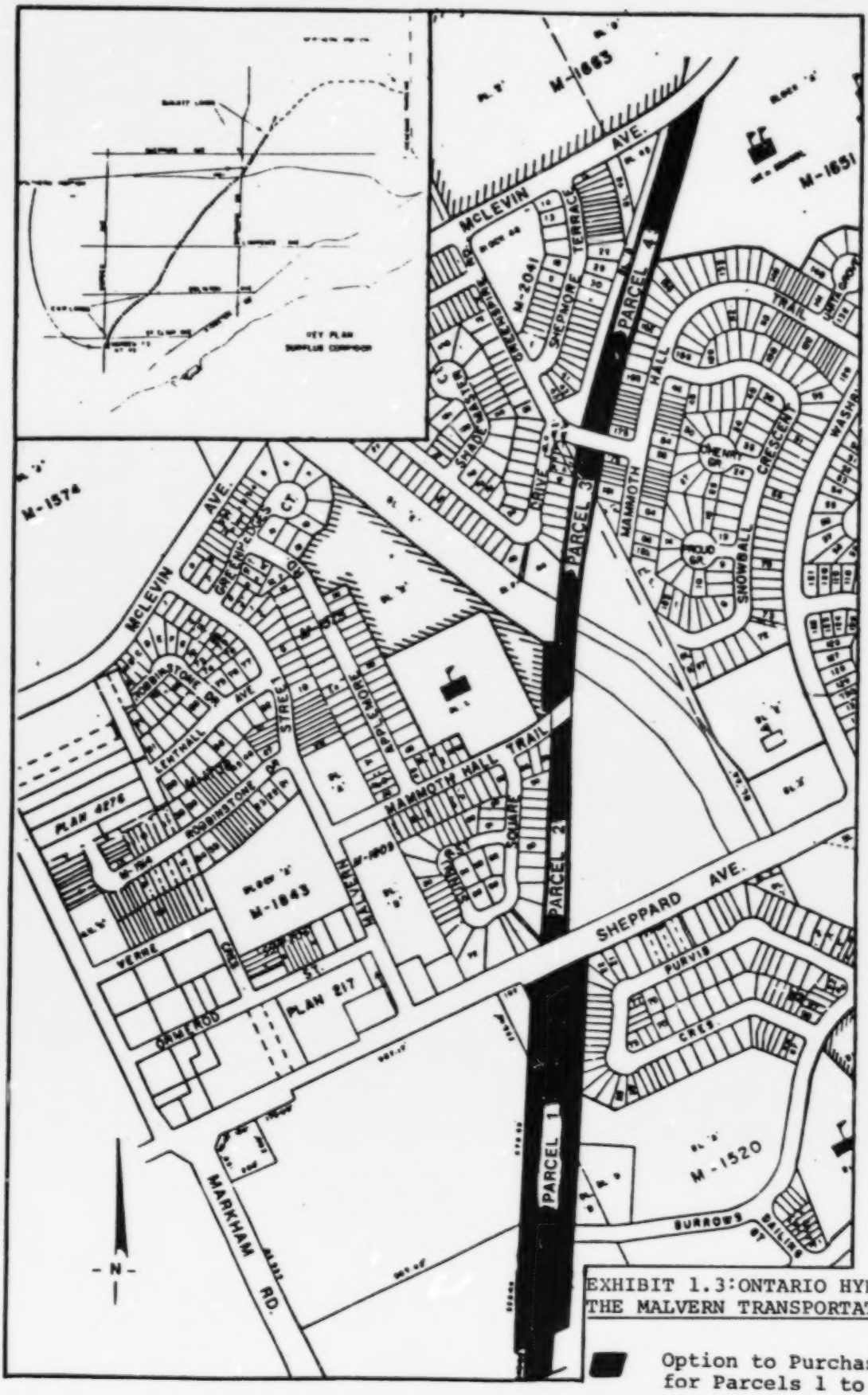


EXHIBIT 1.3: ONTARIO HYDRO LANDS IN THE MALVERN TRANSPORTATION CORRIDOR

Option to Purchase undertaken for Parcels 1 to 4

completed Network 2011 study (including the Metropolitan/T.T.C. Sheppard/Finch Corridor Study) and the Provincial GO-ALRT Northern Section Study.

In view of Scarborough's request for a study, Metropolitan and T.T.C. staff could not justify at that time, recommending to Council that the Hydro lands be purchased at a cost of some $2 million dollars. In a report to the Economic Development and Planning Committee dated May 20, 1986, the Metropolitan Toronto Technical Transportation Planning Committee recommended that Metropolitan Council:

(1) authorize the Technical Transportation Planning Committee to participate with Scarborough staff in a joint study of transit options for the Malvern Transportation Corridor as requested by Scarborough Council, and that such study examine the need to continue to protect the Malvern Transportation Corridor as designated in the Metropolitan Official Plan;

(2) request Ontario Hydro not to sell any of its lands in the Malvern Transportation Corridor prior to Metropolitan Toronto Council's consideration of the joint Metropolitan/Scarborough study;

(3) authorize the Metropolitan Commissioner of Parks and Property to execute a six month option to purchase at market value all Ontario Hydro lands within and adjacent to the Malvern Transportation Corridor from Milner Avenue to McLevin Avenue, effective June 1, 1986, at a cost not to exceed $50,000.00, such funds to be drawn from the Metropolitan Contingency Account; and

(4) request the Minister of Transportation and Communications to participate in the joint Metropolitan/Scarborough study, to support the position in recommendations No.(2) and No.(3) above and to confirm that the cost of the option to purchase would be eligible for a 75 per

cent. Provincial subsidy following project approval of a specific transit facility using the subject lands.

These recommendations were subsequently adopted by Metro Council on June 10, 1986.

1.3 Study Objectives

Following discussions with the various interested agencies, the objectives of the study were established as follows:

1. Review transit needs of the Malvern Community, Northeast Scarborough in general and the Metro/Durham and Metro/York cross-boundary travel as they relate to use of the Malvern Transportation Corridor; and

2. Recommend courses of action for future Corridor protection for either all or part of the Malvern Transportation Corridor, as designated in the Metropolitan Official Plan and specifically with regard to the Ontario Hydro lands in and immediately adjacent to the Corridor.

It is hoped that by achieving these objectives, future transit requirements can be more clearly defined, which in turn should make it easier to handle questions regarding Corridor control and development proposals in the future.

As there are inter-regional, as well as local transportation issues to be examined, staff from the M.T.C. (Toronto Area Co-ordinating Office), participated in this study along with Metropolitan Toronto, T.T.C. and City of Scarborough staff.

1.4 Study Approach

The approach taken for this study followed the intent of Scarborough's request, as contained in their response to Network 2011, in that all

reasonable transit options for the Malvern Corridor were examined. The options considered are described in section 1.5.

An assessment of the options using five factors thought to be the most appropriate in determining the relative attributes of each option was then prepared. The five factors used are as follows:

1. Development Potential
2. Transit Service/Ridership
3. Maintenance Yards and Terminal Facility Requirements
4. Capital and Operating Costs
5. Community Impacts

The results of the assessment are given in section 2.0 of this report. In section 3.0 the importance of the five factors are discussed in relation to each other in order to eliminate all but the key decision making factors. The trade-offs among these key factors are then discussed in order to arrive at a preferred option. The implications for coridor protection are then discussed and recommendations made for future action and further study.

1.5 Determination of Future Transit Options

At an early meeting of the study group, a comprehensive list of reasonable options for transit service from Scarborough City Centre to the Malvern Community was compiled for assessment. Different technologies were considered, (i.e. bus, bus lanes, busway and RT), as well as different routes for the bus options.

Seven options were identified and are listed on Exhibit 1.4 and illustrated on Exhibits 1.5 through 1.10.

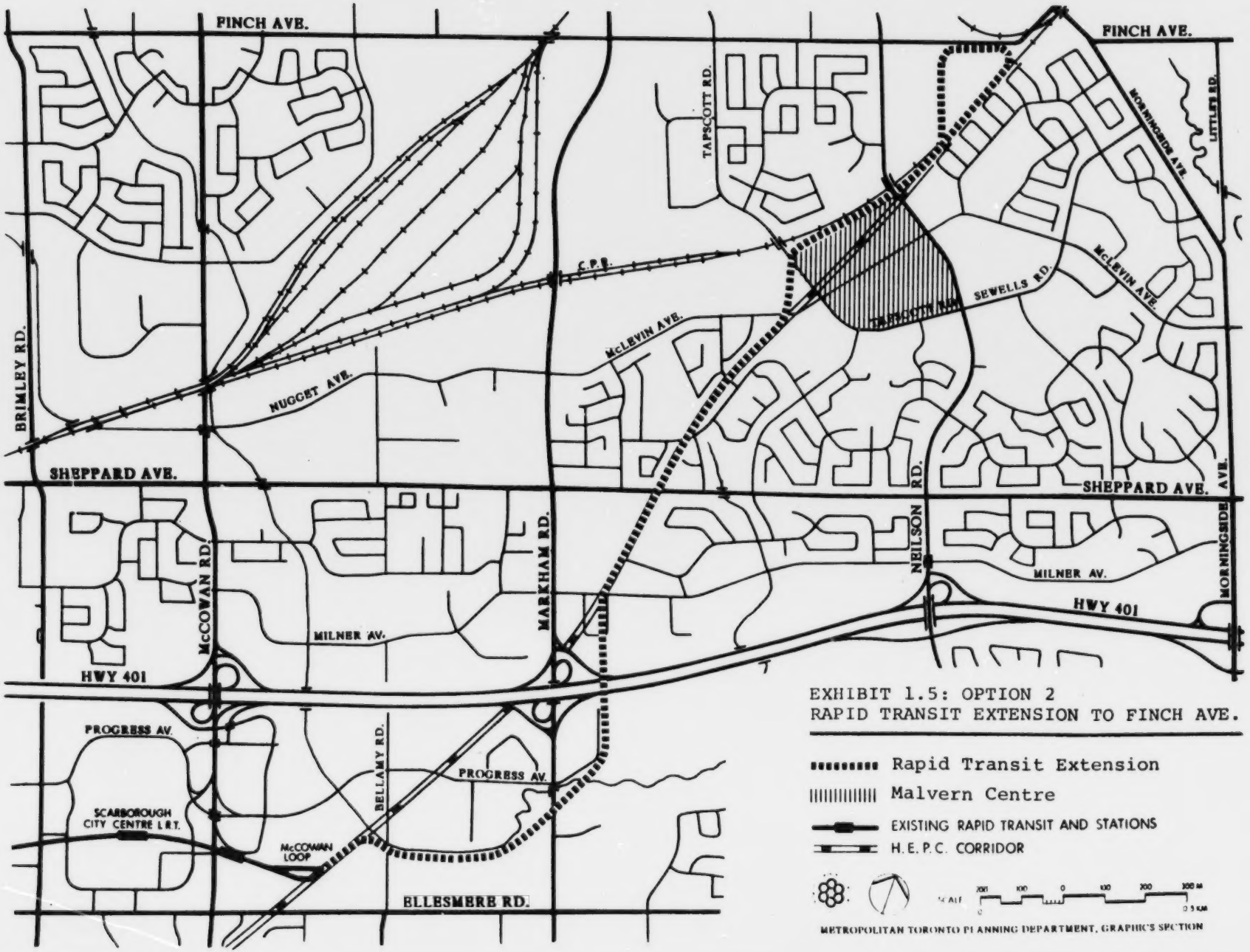
EXHIBIT 1.4

FUTURE TRANSIT OPTIONS

	OPTION	CHARACTERISTICS
1.	"Do Minimum"	Existing Malvern bus services continued with incremental improvements in frequency as demand warrants.
2.	R.T. to Finch	Extension of R.T. from McCowan to Finch Avenue using designated right-of-way.
3.	R.T. to Sheppard	Extension of R.T. from McCowan to Sheppard Avenue using designated right-of-way. (Feeder bus service beyond Sheppard Avenue)
4.	R.T. to Milner	Extension of R.T. from McCowan to Milner Avenue using designated right-of-way. (Feeder bus service beyond Milner Avenue)
5.	Busway - McCowan to Finch	Busway from McCowan to Finch Avenue using designated right-of-way.
6.	Busway/Bus Lanes Malvern Centre to City Centre	Busway from Malvern Centre to Sheppard Avenue using designated right-of-way plus exclusive bus lanes on Sheppard Avenue and Brimley Road to connect to the City Centre.
7.	Busway/Bus Lanes - McCowan to Malvern Centre	Busway from McCowan Road to Sheppard Avenue using designated right-of-way, continuing in mixed traffic [1] easterly along Sheppard to Washburn and along Washburn, and then Tapscott to Malvern Centre.

NOTE:

1. exclusive bus lanes if necessary


FINCH AVE.
FINCH AVE.
TAPSCOTT RD.
MORNINGSIDE AVE.
LITTLEY RD.
C.P.R.
McLEVIN AVE.
SEWELLS RD.
McLEVIN AVE.
BRIMLEY RD.
NUGGET AVE.
SHEPPARD AVE.
SHEPPARD AVE.
McCOWAN RD.
MARKHAM RD.
NEILSON RD.
MORNINGSIDE AVE.
MILNER AV.
MILNER AV.
HWY 401
HWY 401
PROGRESS AV.
PROGRESS AV.
BELLAMY RD.
SCARBOROUGH CITY CENTRE L.R.T.
McCOWAN LOOP
BLLESMERE RD.
EXHIBIT 1.5: OPTION 2
RAPID TRANSIT EXTENSION TO FINCH AVE.
Rapid Transit Extension
Malvern Centre
EXISTING RAPID TRANSIT AND STATIONS
H.E.P.C. CORRIDOR
METROPOLITAN TORONTO PLANNING DEPARTMENT, GRAPHICS SECTION

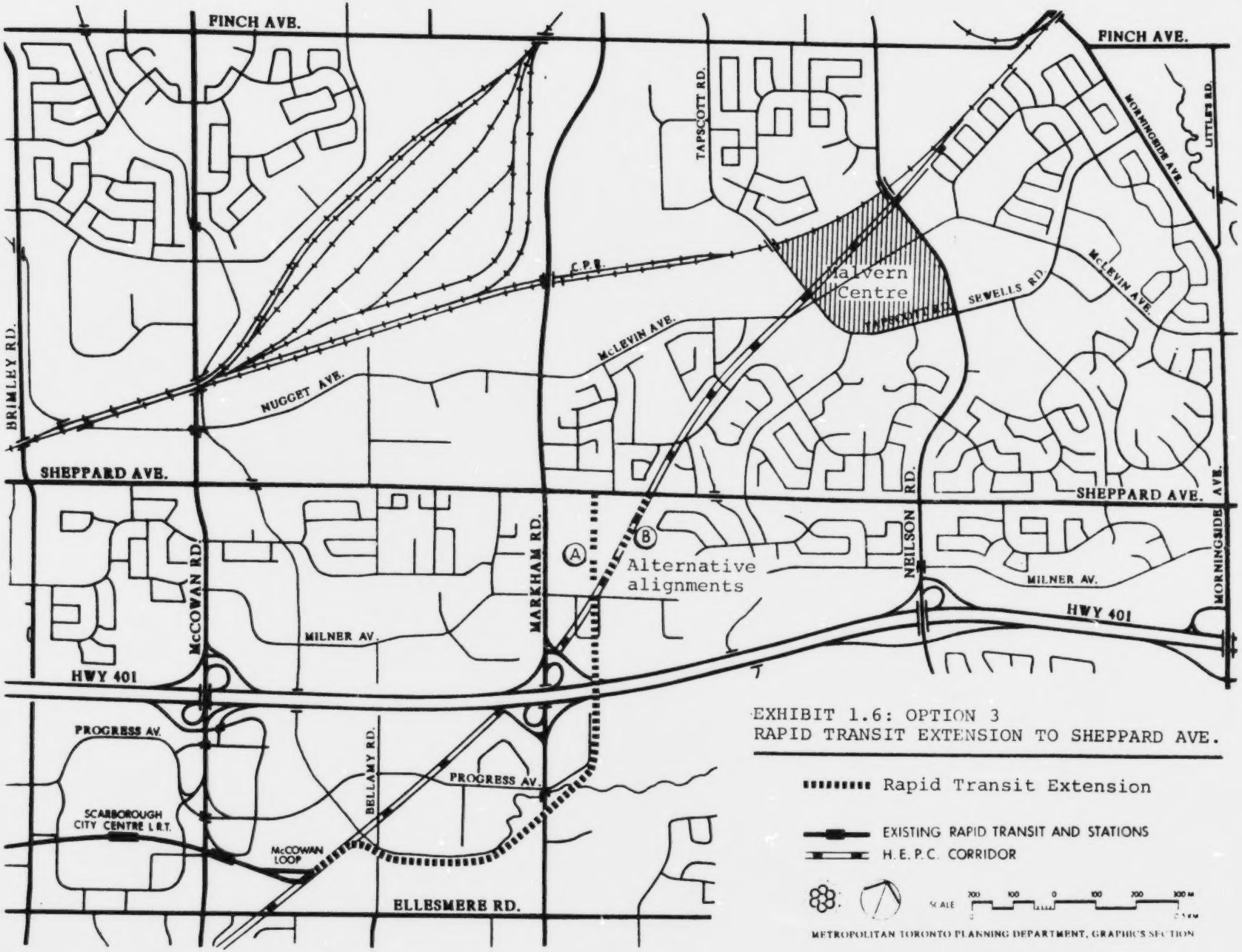


EXHIBIT 1.6: OPTION 3
RAPID TRANSIT EXTENSION TO SHEPPARD AVE.

Rapid Transit Extension

EXISTING RAPID TRANSIT AND STATIONS

H.E.P.C. CORRIDOR

SCALE 700 100 0 100 700 1000 M

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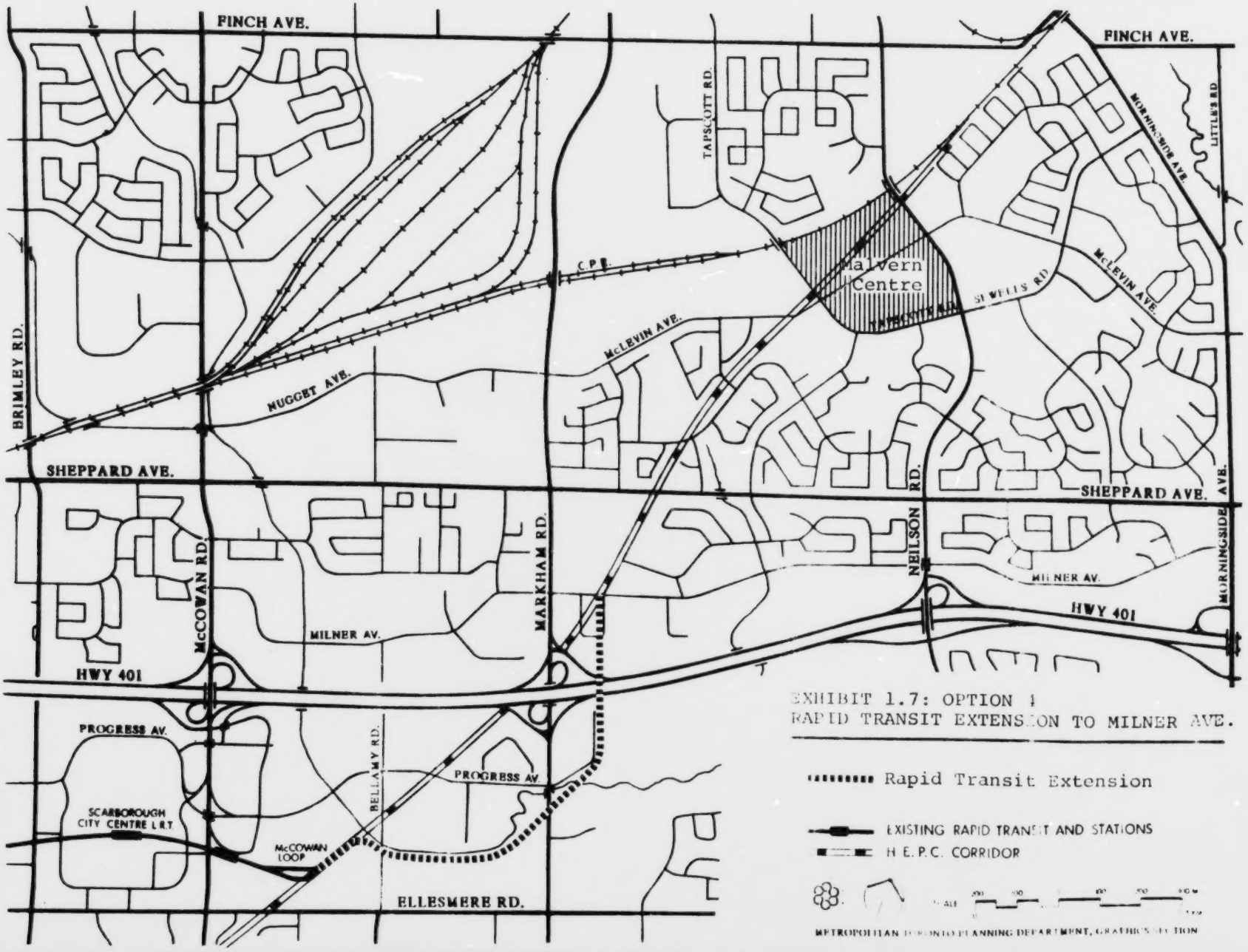


EXHIBIT 1.7: OPTION 1
RAPID TRANSIT EXTENSION TO MILNER AVE.

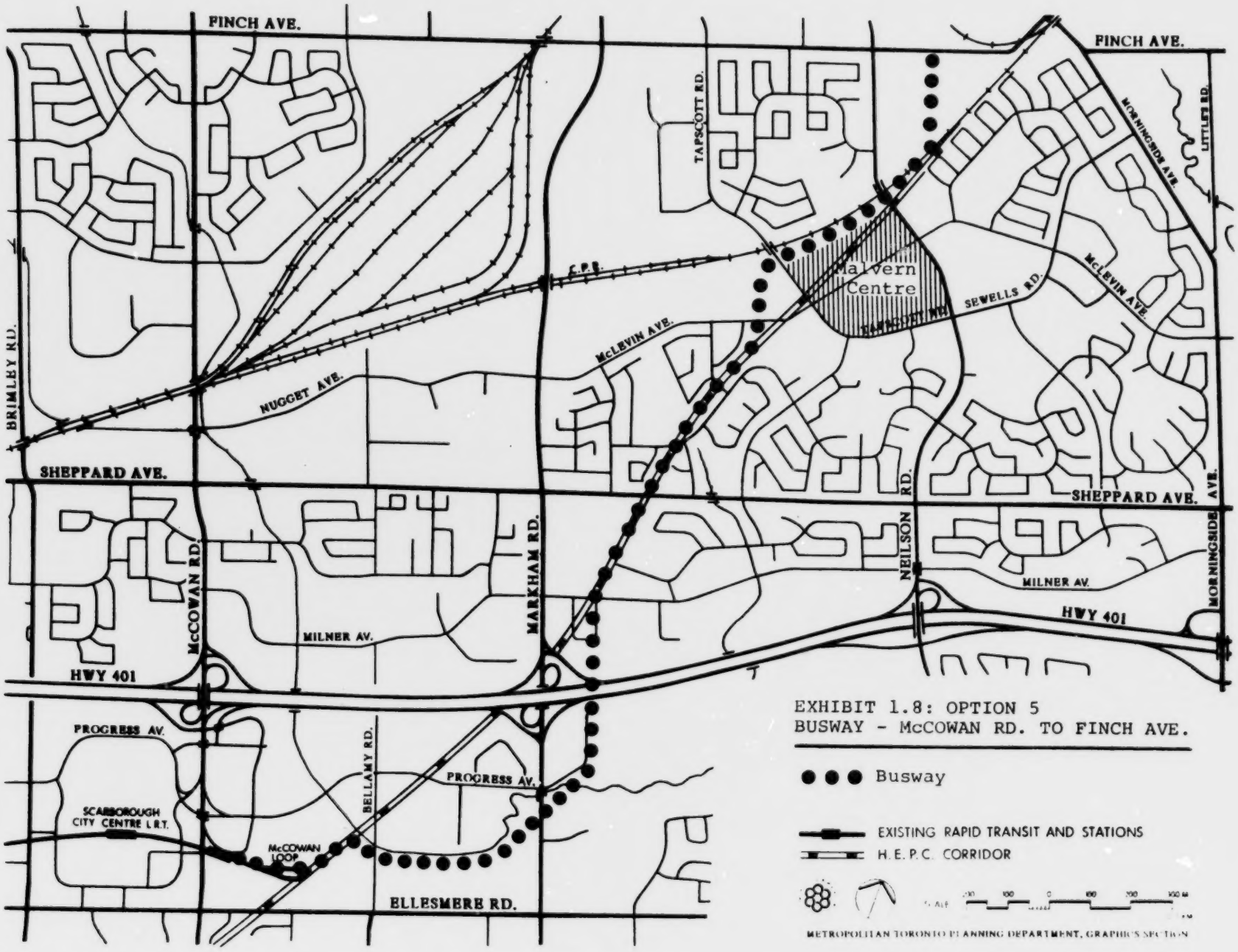


EXHIBIT 1.8: OPTION 5
BUSWAY - McCOWAN RD. TO FINCH AVE.

●●● Busway

EXISTING RAPID TRANSIT AND STATIONS

H.E.P.C. CORRIDOR

METROPOLITAN TORONTO PLANNING DEPARTMENT, GRAPHICS SECTION

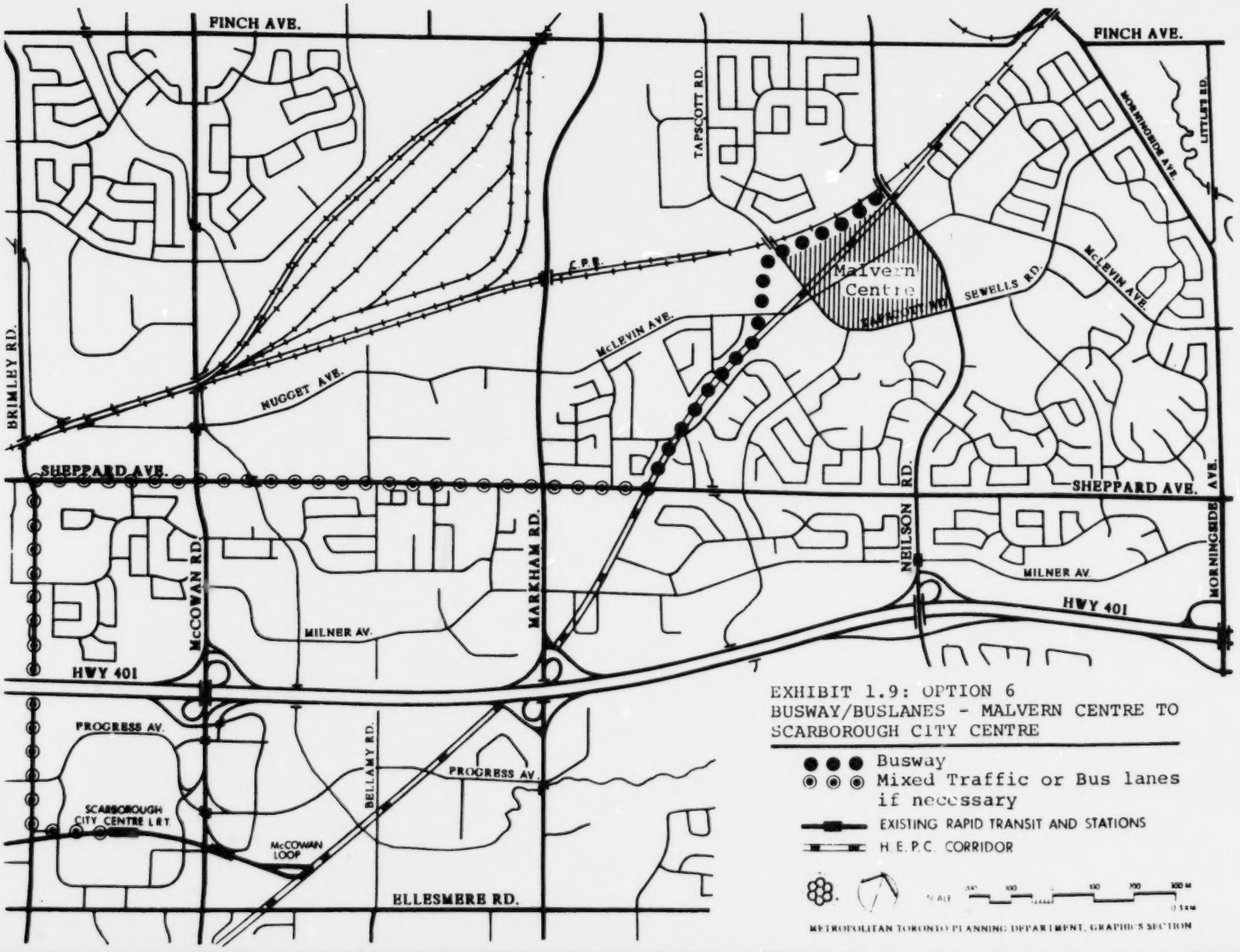


EXHIBIT 1.9: OPTION 6
BUSWAY/BUSLANES - MALVERN CENTRE TO SCARBOROUGH CITY CENTRE

- Busway
- Mixed Traffic or Bus lanes if necessary
- EXISTING RAPID TRANSIT AND STATIONS
- H.E.P.C. CORRIDOR

METROPOLITAN TORONTO PLANNING DEPARTMENT, GRAPHICS SECTION

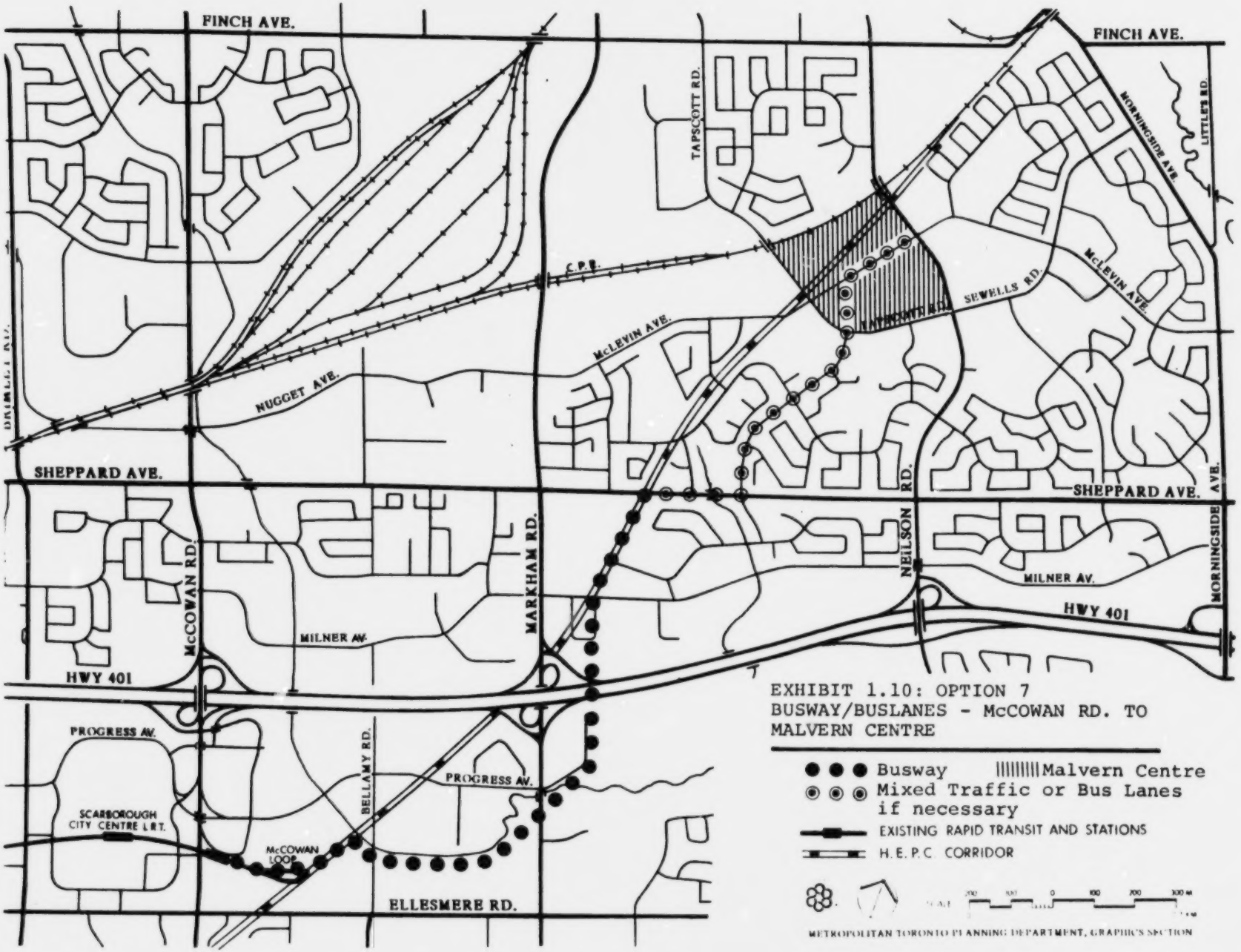


EXHIBIT 1.10: OPTION 7
BUSWAY/BUSLANES - McCOWAN RD. TO MALVERN CENTRE

2.0 ASSESSMENT OF OPTIONS

2.1 Development Potential

The current population and employment figures and 2011 projections for the area around the Malvern Transportation Corridor are shown on Exhibit 2. 1. The zone system used is shown in Exhibit 2.2. The forecasts were prepared by the Research Division of the Metropolitan Planning Department in consultation with Scarborough Planning staff.

Four areas along the Corridor have been identified where additional development could be accommodated if the RT were to be extended. These areas are:

1. McCowan Station area
2. Progress Industrial District East
3. Markham/Milner/Sheppard Area
4. Malvern Centre

The McCowan Station area is part of the Scarborough City Centre. However, should the RT be extended, it is feasible that the storage and maintenance facilities and the commuter parking at the McCowan station could be relocated to either the Milner/Markham/Sheppard area or the Finch/Neilson area. This would free-up land close to McCowan station that could undergo development intensification. Development of these sites adjacent to the McCowan station could accommodate approximately 3,000 jobs and better enable the City Centre to achieve its employment goal of 40,000 jobs and its high transit modal split target of 55%.

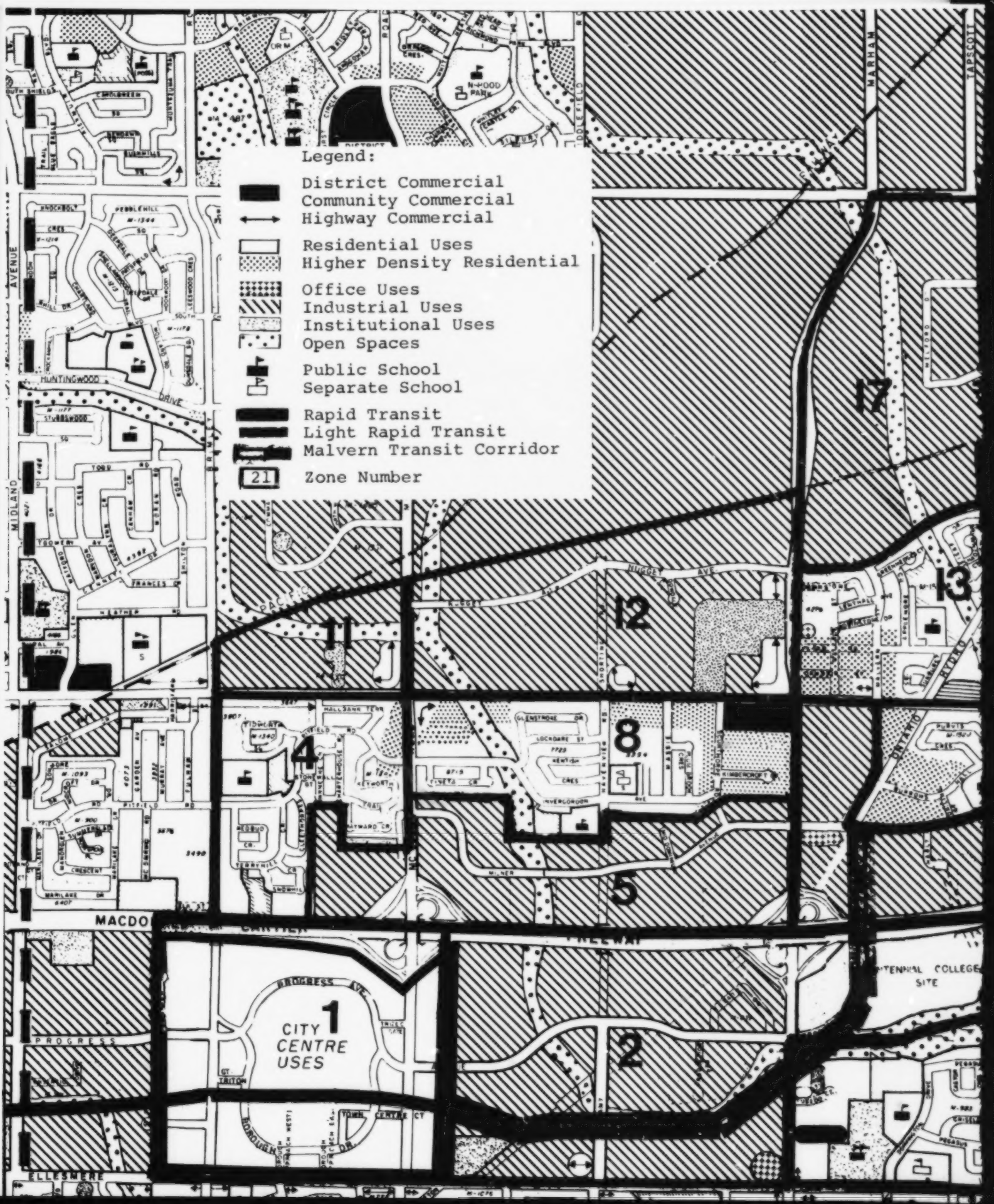
The Scarborough Official Plan has recently been amended (O.P.A. 619) to include policies that encourage intensification along the existing RT line at station locations. When a decision is made to extend the RT, the Scarborough Official Plan would be further amended to include similar policies for proposed station locations along the Malvern Corridor.

EXHIBIT 2.1

CURRENT AND FORECAST DEMOGRAPHIC DATA

Zone #	Existing Population[1]	Existing Employment	Future (2011) Population	Future (2011) Employment[2]	
1.	-	11,159	2,350	40,000	
2.	-	7,840	-	30,000	(transit dependent)[3]
				14,900	(non-transit dependent)[3]
3.	8,256	1,000	7,750	1,000	
4.	2,600	322	2,500	322	
5.	-	2,961	-	3,500	
6.	-	1,709	3,000	10,000[3]	(Option 3 only)
				7,900[3]	(Options 2&4 only)
				2,900	(non-transit dependent)
7.	-	235	-	1,130	
8.	3,939	614	6,550	600	
9.	2,756	167	3,100	170	
10.	2,004	248	2,550	250	
11.	-	1,050	-	850	
12.	-	4,193	-	4,150	
13.	3,964	200	4,450	700	
14.	3,711	51	4,050	700	
15.	3,976	25	4,550	25	
16.	3,598	25	4,000	25	
17.	-	2,760	-	4,350	
18.	4,641	25	5,050	6,000	(Option 2 only)
				2,000	(non-transit dependent)
19.	3,284	105	5,150	1,550	
20.	2,718	25	3,500	25	
21.	8	21	9,000	100	Additional
Total	45,455	34,735	67,550	105,347	(Option 2 Only)
				103,447	(Option 3 Only)
				101,347	(Option 4 Only)
				79,247	(Non-transit dependent)

1. Source: Scarborough Statistics - 1984 Population Monitor
2. Projections based on average of 50 employees per ha. of industrial and commercial land (developed and undeveloped)
3. Projections based on average of 80 employees per ha. of industrial and commercial land and 5,000 jobs within close proximity to RT Stations
4. Refer to Exhibit 2.2 for zone boundaries


Legend:
District Commercial
Community Commercial
Highway Commercial
Residential Uses
Higher Density Residential
Office Uses
Industrial Uses
Institutional Uses
Open Spaces
Public School
Separate School
Rapid Transit
Light Rapid Transit
Malvern Transit Corridor
21
Zone Number
CITY CENTRE USES
1
2
4
5
8
11
12
13
17
MACDONALD
PROGRESS
ELLESMERE
MIDLAND AVENUE
MARKHAM
TAPSCOTT
HUNTINGWOOD DRIVE
NUGGET AVE
FREEWAY

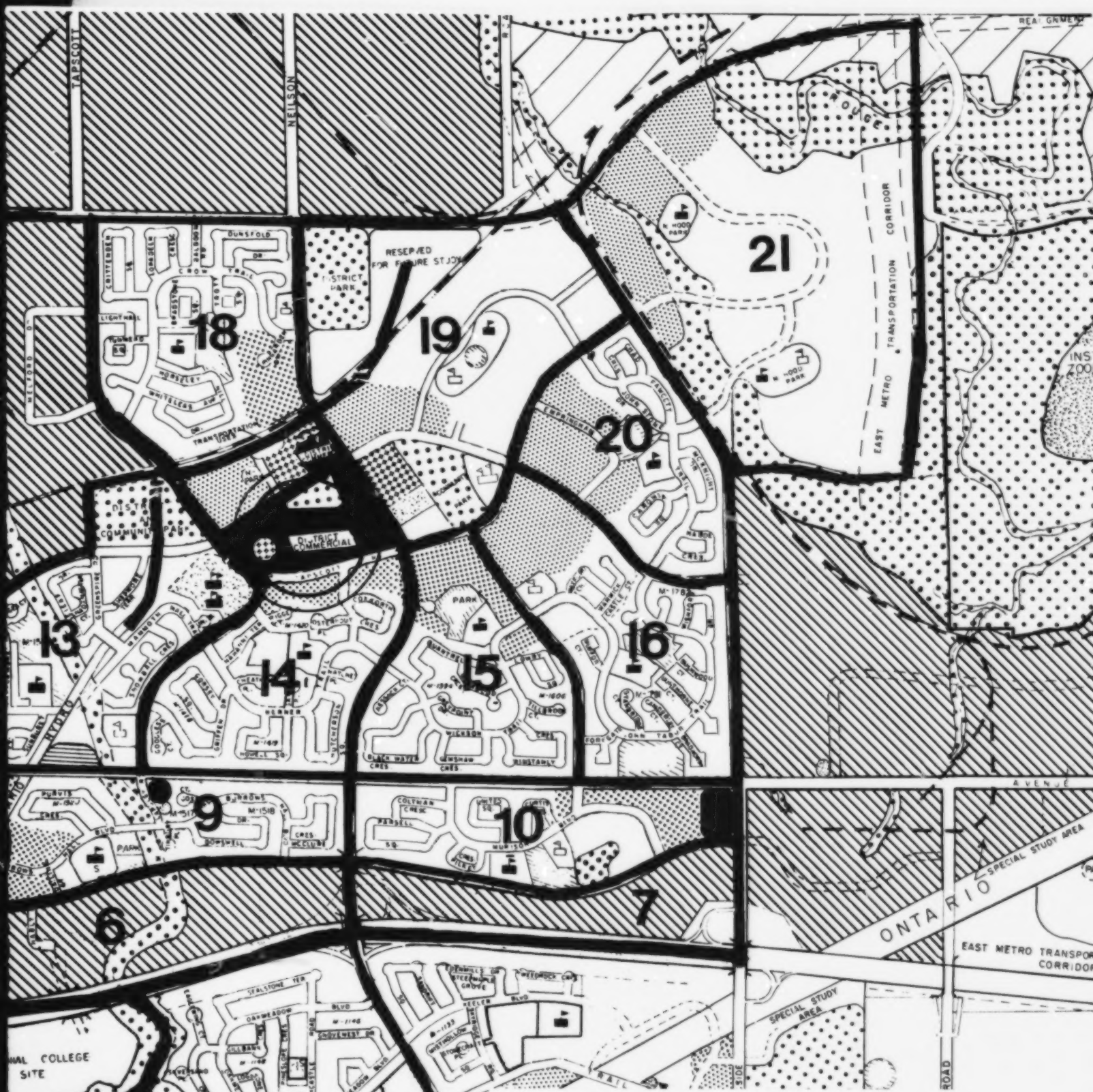


EXHIBIT 2.2:
LAND USE MAP AND ZONE SYSTEM USED FOR PROJECTIONS

Typically for the Progress Industrial District, By-law No.20639 allows for office development of 3 times density within 150 metres walking distance of existing stations, with allowable density decreasing with distance from the stations. Applying the allowable densities, as defined in this By-law, to the three possible RT stations in the Progress Industrial District, (at Bellamy Road, Markham Road and Centennial College) produces a total of approximately 36,000 jobs, or 12,000 jobs per station, which would mean a future employment level of 51,000 for the Progress Industrial District (Zone 2 on Exhibit 2.2.). This number of jobs however, would not be supportable due to road capacity constraints irrespective of the potential transit capacity. Therefore, the Scarborough development policies were used only as a basis for determining development potential and based on the study team's experience, 'rationalized' downward to a figure that was thought to be more realistic in terms of its ability to be served by the road system.

It should be emphasized that a comprehensive traffic impact study was not carried out as this was outside the bounds of the study. The development opportunities identified therefore, are to be taken as a guide only. These figures are shown in Exhibit 2.3 and summarized below.

McCowan Station	(consolidation of City Centre objectives only)
Progress Industrial District	15,000 extra jobs (Option 2,3 and 4 only)
Milner/Sheppard Area	7,000 extra jobs (Option 2,3 and 4 only)
Malvern Centre	4,000 extra jobs (Option 2 only)

If Scarborough and Metropolitan Councils support the retention of the Malvern Corridor, detailed traffic studies would have to be undertaken to determine more precise limits of development for each of these areas. For example, development of the Progress Industrial District would require greater north-south road capacity which could be provided by extension of Progress Court across Highway 401. Further detailed study on the feasibility of the Progress Court crossing and connections to Highway 401 would

EXHIBIT 2.3

DEVELOPMENT AND TAXES GENERATED BY THE TRANSIT OPTIONS

	1. Do-Minimum	2. RT to Finch	3. RT to Sheppard	4. RT to Milner	5. Busway McCowan to Finch	6. Busway/ Bus Lanes Malvern Centre to City Centre	7. Busway/ Bus Lanes McCowan to Malvern
Additional generated employment	0	26,000	24,000	22,000	minimal	minimal	minimal
Additional office floor space (m^2)*	0	702,000	648,000	594,000	minimal	minimal	minimal
Additional Tax Assessment** to Scarborough	0	$42 million	$39 million	$36 million	minimal	minimal	minimal

* based on 27 sq.m./employee of office space

** The annual tax assessment for office development have been calculated to be in the region of $128/sq.m. of floor space and $68/sq.m. for lower density industrial development (see Appendix A for details). The difference ($60/sq.m.) between the $128/sq.m. and $68/sq.m. figures was applied to the "Additional Office Floor Space" to arrive at the estimate of additional tax assessment for Scarborough.

therefore, be essential at some point in the future. This scheme is further discussed in section 3.7 as part of various possible terminal designs. It has to be acknowledged that the Milner/Sheppard and Malvern areas would tend to compete for development and therefore the 13,000 extra jobs may be achievable over a protracted length of time. These extra jobs were thought acheivable for the RT extension options which extended to the particular area in question. The busway options (5, 6 and 7) were thought likely to only attract a small portion of this new development. The number of extra jobs generated by a busway in the Metropolitan area is difficult to estimate when there are subways, LRT and commuter rail lines already in operation.

An attempt was made to identify the benefits to the City of Scarborough provided by the development of this extra office space by estimating the additional tax assessment. The results of this analysis are summarized in Exhibit 2.3; the assumptions used for this analysis are listed in Appendix A.

2.2 Transit Service/Ridership

2.2.1 Current Service to Malvern

The current T.T.C. bus routes operating in the Malvern area are shown on Exhibit 2.4. It can be seen that the routes primarily serve the Scarborough City Centre. Exhibits 2.4 and 2.5 also show the current peak period ridership. These numbers are, of course, quite low in comparison to bus routes serving more mature areas of Metro. Certain of these routes (Milner and Middlefield) do not operate in the off-peak period as demand does not currently warrant doing so. The other routes serving the Malvern Community are "Limited Service Surface Routes" in that they operate generally between 6:00 a.m. and 7:00 p.m. with limited evening and weekend service.

2.2.2 Future Service to Malvern

A 20 minute journey time contour from the Scarborough City Centre was drawn in order to compare the access provided to the Centre (see Exhibit

EXHIBIT 2.4

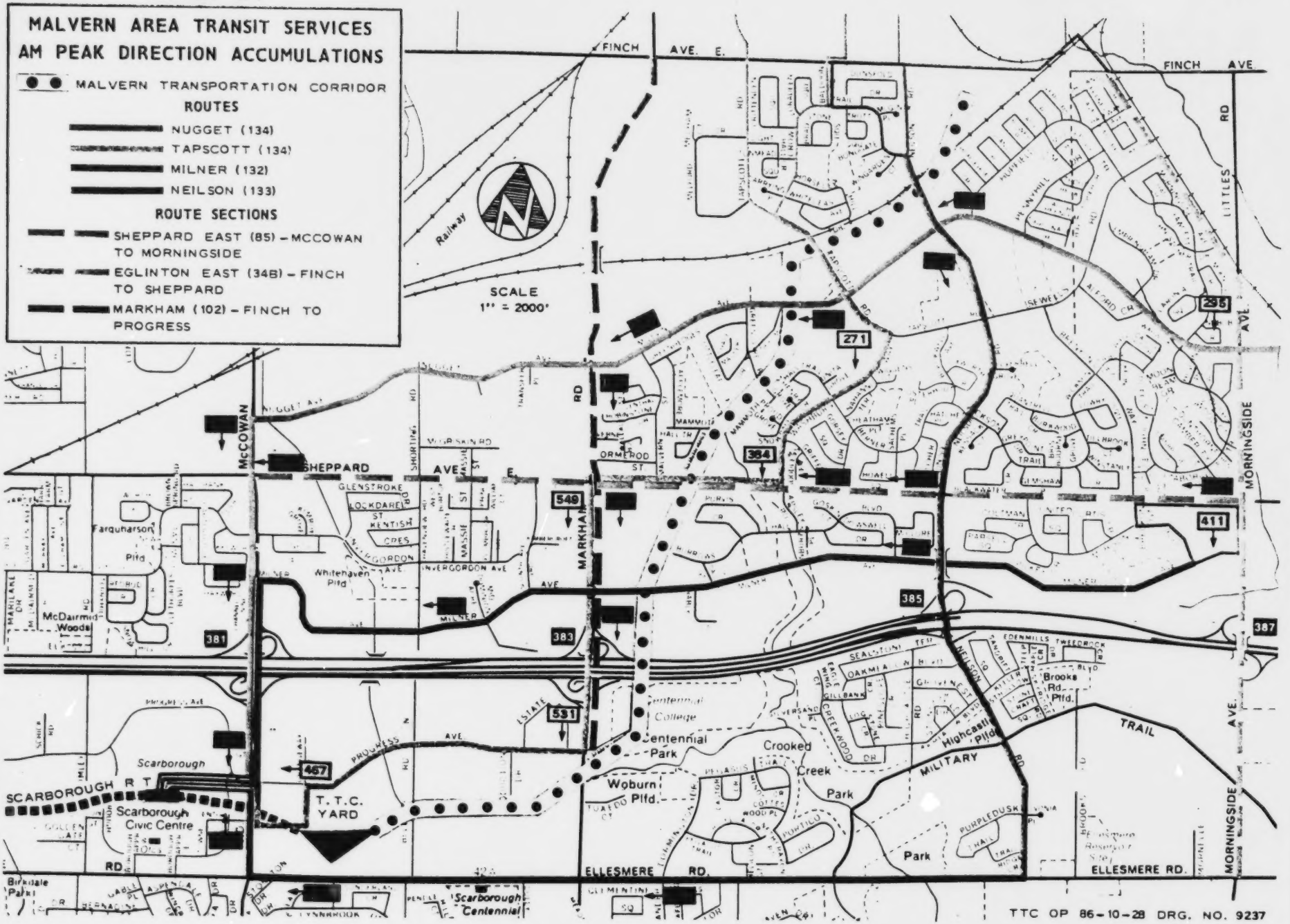

MALVERN AREA TRANSIT SERVICES
AM PEAK DIRECTION ACCUMULATIONS
MALVERN TRANSPORTATION CORRIDOR
ROUTES
NUGGET (134)
TAPSCOTT (134)
MILNER (132)
NEILSON (133)
ROUTE SECTIONS
SHEPPARD EAST (85) – MCCOWAN TO MORNINGSIDE
EGLINTON EAST (34B) – FINCH TO SHEPPARD
MARKHAM (102) – FINCH TO PROGRESS
SCALE
1" = 2000'
FINCH AVE. E.
FINCH AVE
SHEPPARD AVE. E.
McCOWAN
MARKHAM RD
MORNINGSIDE AVE
LITTLES RD
NELSON
MILITARY TRAIL
ELLESMERE RD.
SCARBOROUGH R T
Scarborough Civic Centre
T.T.C. YARD
Scarborough Centennial
Centennial College
Centennial Park
Woburn Pltd.
Crooked Creek Park
Highcastle Pltd
Brooks Rd. Pltd.
Farquharson Pltd.
Whitehaven Pltd
McDairmid Woods
Birkdale Park
271
384
549
411
385
387
381
383
531
467
TTC OP 86-10-28 DRG. NO. 9237

EXHIBIT 2.5

MALVERN AREA

CURRENT A.M. PEAK PERIOD TRANSIT RIDERSHIP

ROUTE OR ROUTE SECTION	COUNT DATE	AM PEAK PERIOD TOTAL BOARDINGS	AM MAX-HOUR PEAK POINT RIDERSHIP
Nugget (131)	86-02-25	806	243
Tapscott (134)	85-10-07	1,404	325
Milner (132)	85-09-04	265	110
Neilson (133)	86-02-25	1,229	273
Sheppard East (85) (McCowan-Morningside)	86-03-17	2,223	641
Markham (102) (Finch-Progress)	85-11-06	827	127
Eglinton East (34B) (Finch-Sheppard)	86-04-14	1,448	269

Source: Toronto Transit Commission

Note: a.m. Peak Period: 6:00 a.m. to 9:00 a.m.

2.6). This analysis also shows indirectly, the relative access provided from Malvern to other parts of the T.T.C. system as passengers from Malvern would have to pass through the City Centre if destined to the Toronto Central Area for example. The further the contour is shown away from the City Centre, the faster the access provided. It can be seen that currently, the recently re-routed Malvern buses provide excellent access to the City Centre. The poorest service to the City Centre is currently from the north-west as the Sheppard Avenue buses do not serve the City Centre directly.

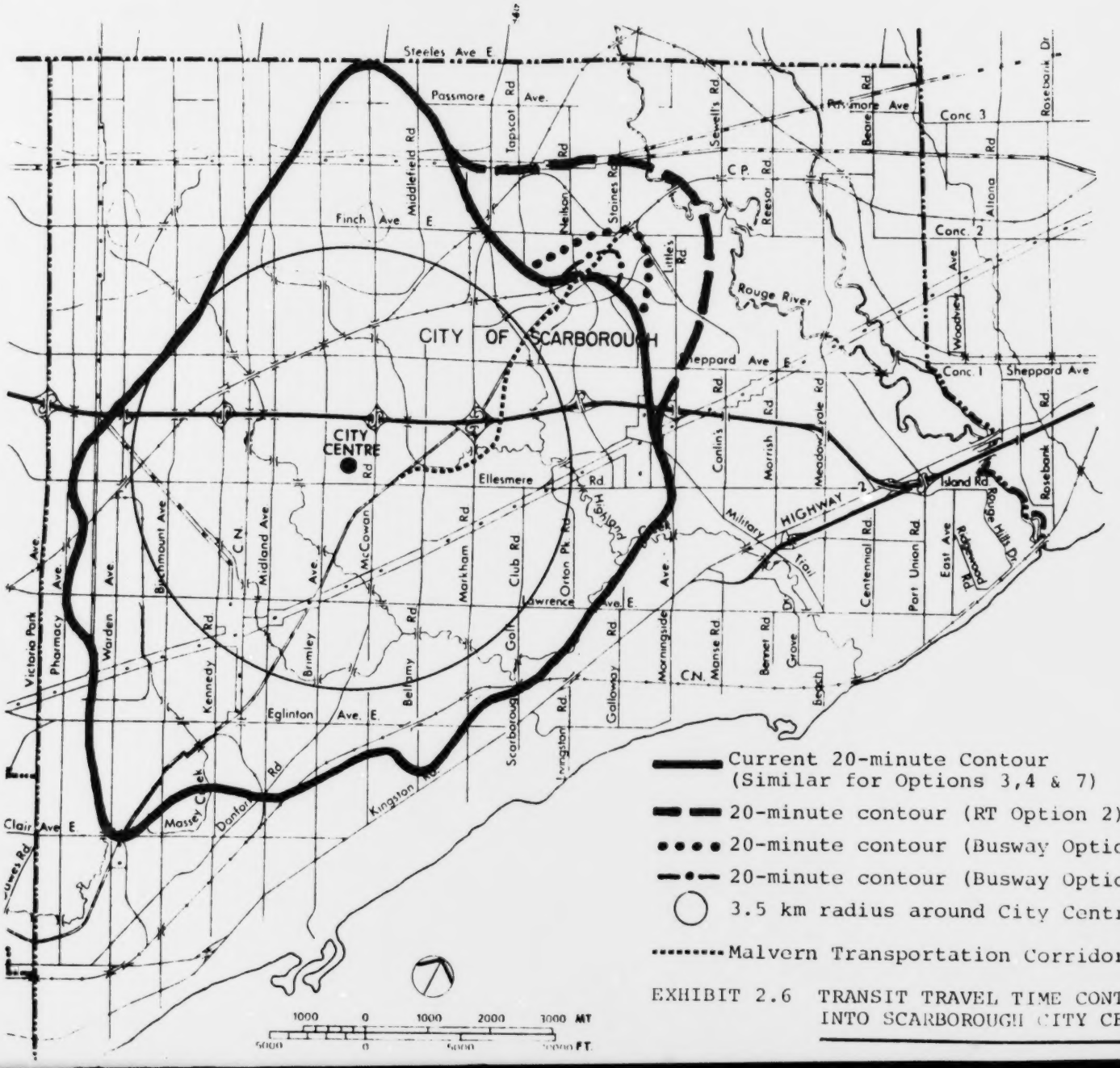
As far as the seven future options under consideration here are concerned:

Option 1, the do-minimum option, will undoubtedly provide a slower service in the future as development continues in Scarborough and the amount of road traffic increases, thus slowing down bus services;

Option 2, RT extension to Finch, would provide the greatest improvement in access for the Malvern Community although the improvement would only be marginal, i.e. approximately 3 minutes reduction in travel time from the Malvern Centre to the City Centre.

Options 3 and 4, RT extensions to Sheppard and Milner respectively, would provide little or no increase in access time over today's routes as a change of mode would be required at either Milner or Sheppard, which eliminates the benefit of the higher RT speed.

The only busway option to offer a slight improvement in service to the Malvern Community, would be Options 5 (McCowan to Finch) and 6 (Brimley/Sheppard to Finch). Generally speaking, none of the busway options would improve accessibility significantly. However, they would help to maintain current accessibility while bus speeds in mixed traffic reduce over time.



Current 20-minute Contour
(Similar for Options 3,4 & 7)

20-minute contour (RT Option 2)

20-minute contour (Busway Option 5)

20-minute contour (Busway Option 6)

3.5 km radius around City Centre

Malvern Transportation Corridor

EXHIBIT 2.6 TRANSIT TRAVEL TIME CONTOURS INTO SCARBOROUGH CITY CENTRE

2.2.3 Inter-regional Service

Commuters from the Region of Durham who work in Metro have a tendency to be employed in either the Toronto Central Area, due to the large employment base, or Scarborough, due to its proximity. A similar situation can be observed for residents of Markham in the Region of York.

In the future, as Metro population will remain more or less stable, the employees for the vast number of jobs forecast to be created in Metro over the coming years, will have to come increasingly from the outlying regions, where population is forecast to increase greatly. The Malvern Corridor has to be considered carefully in regard to the potential for serving this increasing inter-regional market from Markham and Durham, destined to either Scarborough or other locations within Metro. The M.T.C. concept of transit 'Gateways' into Metro is a recognition of this trend in increasing inter-regional commuting.

In the future, the busway options would provide service into Scarborough City Centre without experiencing the delay of the then likely congested roads. However, the busway options are not thought to be a significant attraction in providing a 'Gateway' into Metro, particularly when compared with the RT options wherein less transfers and faster speeds would be achieved. The busway options would provide a reasonably attractive service into Scarborough City Centre for some Markham commuters, but the change of mode required at the City Centre, and possibly a further one at the end of the RT, would be unlikely to encourage transit usage for access to other parts of Metro. The busway options would not provide an attractive service for the potential Durham park'n'ride market, as, after a short journey to either McCowan or the City Centre, again a change of service would be required.

All three RT options, with parking provided at Milner, would offer a good park'n'ride 'Gateway' facility onto the T.T.C. system, particularly for the Durham commuters. Option 2 (RT to Finch) would offer superior service to

the Markham market. However, it is felt that the majority of the Markham market may use more direct north-south routes into Metro instead of accessing the RT which would be somewhat east of their point or origin.

In summary, any of the three RT options are thought to provide an adequate 'Gateway' for the increasing inter-regional transit market. The busway options are not considered to provide a significant inter-regional function.

2.2.4 Ridership Forecasting Method

The ridership forecasts were based on the current Service Planning Ridership Forecasting Method of the T.T.C., adapted for the Scarborough RT line, and calibrated to current RT ridership levels. Given the distant horizon for these ridership forecasts, and the associated uncertainties in interim and long term developments, the forecasts must be regarded as estimates only.

The forecasting procedure is not sensitive enough to enable production of ridership estimates specific to the various technologies or RT service options proposed. Instead, the forecasting procedure provides an estimate of RT ridership in the entire corridor. Forecasting was undertaken for both northbound and southbound travel on the RT extension. Having determined that southbound would be the a.m. peak direction, the analysis focussed on a.m. peak hour southbound peak point travel demand on the proposed SRT extension. This demand would determine fleet requirements for the RT extension in 2011.

The forecasting method estimates home-based work and school trips separately, then combines and adjusts these results to account for other purpose trips, absenteeism and part-time employment, and to produce total transit ridership estimates. Residential distribution and mode split rates for Scarborough City Centre employees in the year 2011 were based on extrapolations of current information (1985 Scarborough City Centre Monitoring Report).

Mode split and trip distribution factors, specific to the Malvern study area and the SRT, were developed for this application. For 2011 forecasts, the SRT mode split factors were adjusted to account for riders who will use the Sheppard Subway line. Once total daily SRT trips were identified, empirical peaking factors (specially developed for the SRT) were applied to arrive at a final maximum hour, peak direction ridership forecast.

2.2.5 Assumptions

The assumptions made in the estimation of a ridership forecast for the Malvern Corridor are listed in Appendix B. The key assumption is that, if the proposed Sheppard subway between North York and Scarborough City Centres is in place, Malvern residents destined to the Toronto Central Area would use the Sheppard Subway rather than the Malvern RT due to fewer transfers necessary and a faster journey time. It follows that if the Sheppard Subway was not in place, the ridership forecasts for the Malvern RT extension would be higher.

2.2.6 2011 Ridership Forecasts

The estimated a.m. maximum-hour peak direction (southbound) ridership on the SRT extension (east of McCowan Station) for 2011 is in the range of 2,600 to 2,900 riders. If the Sheppard subway were not in place, the forecast would be in the range of 2,900 to 3,100 riders. These figures were determined using the T.T.C. Planning Department's current ridership forecasting method, adapted for the Scarborough RT, and based on population and employment projections for the Malvern Corridor. Because of the high employment projected for the Progress Avenue Industrial Area, the peak point on the extension is expected to be in this same industrial area (where the line crosses Highway 401), although it could alternatively be just east of Scarborough Centre Station. A.M. maximum-hour northbound ridership in 2011 on the SRT extension east of McCowan Station is expected to be approximately 1,200 riders at a peak point on the extension also located in the Progress Avenue Industrial Area.

Approximately 11,000 daily net new boardings on the T.T.C. system are expected to result from employment growth which is directly attributable to the proposed extension of the SRT into the Malvern Corridor. However, not all of these net new boardings would necessarily use the RT extension itself.

Ridership forecasts for the reserved bus lane options have not been developed because these options would not significantly alter the feeder bus network in the study area, nor would they divert large volumes of riders from other routes.

2.3 Maintenance Yards and Terminal Facility Requirements

2.3.1 Maintenance Yard and Carhouse

Any new addition to the Scarborough RT line will generate maintenance requirements for both additional vehicles and plant (way, electrical and building) as well as terminal facility requirements at the end station.

The "Rail Yard Needs Study: to 2001", November, 1983, addressed the rail network expansion scenarios which would generate increments in the rail vehicle fleet and attendant storage requirements. Future fleet size is dependant upon such factors as route length, vehicle speeds, level of service and vehicle capacity. Vehicle estimates for the base network and proposed system expansion were developed for a "mature" level of operation. The projected SRT fleet size for 2001 was 15 trains or 36 vehicles. The McCowan Yard where these vehicles are stored is located east of McCowan Road and north of Ellesmere Road. Access is from Ellesmere Road to a triangular area of approximately 1.16 hectares (2.86 acres). The property is bounded by industry to the north and east, and the residential school for Handicapped Children to the south-west. It was designed to provide for storage and light maintenance of 24 linear induction motor driven vehicles, with accommodation for other related activities, including a parking area for vehicle operators. The pre-design report for the McCowan Yard and the Rail Yard Needs Study indicated that a 50 per cent. expansion with respect to

storage of additional vehicles could be accommodated. The trackbed and trackwork would have to be adjusted accordingly. The 50 per cent. expansion capability did not apply if the SRT were to be extended with a through-track in the McCowan Yard. If, for the RT extension, some services are short-turned at McCowan, further land would be required for a tail track.

A Toronto Transit Commission Report prepared on January 30, 1980 stated "If the light rail transit system (subsequently changed to ICTS technology), is extended easterly to the Malvern development as is now planned, much larger yard and carhouse facilities would be required at that time". Therefore, the McCowan Yard was seen to be an interim facility which would be relocated if the line was extended.

The future requirements for vehicles to service the extended RT line have been determined by T.T.C. to be between 60 and 70 vehicles if the line is extended to Finch Avenue, and between 50 and 60 vehicles if the line is extended to Sheppard Avenue or Milner Avenue. It was assumed that the present practice of trucking the SRT vehicles to the Greenwood Yard for heavy maintenance would be discontinued due to the larger fleet size. Therefore, it was necessary to plan for the construction of a major repair facility in association with the new storage yard. To determine the size of the parcel of land required for a major repair facility and a carhouse combined, the guidelines from the Rail Yard Needs Study were used.

To accommodate between 50 and 60 vehicles a parcel of land 5 to 7 acres in size would be required. To accommodate between 60 and 70 vehicles, a parcel of land between 7 and 9 acres is required. Assuming the McCowan Yard cannot be expanded or that from a development perspective it is not desirable to expand it, other locations such as the Federal Land at Sheppard and Markham (pending release by the Post Office) could be evaluated. The option of having two yards, one at McCowan and the other at Finch and Sheppard was not considered feasible due to the costs and

operational difficulty. Further, if a new site was developed the lands at McCowan could likely be used to benefit the City of Scarborough's development objectives due to its proximity to the City Centre.

2.3.2 Terminal Facilities

With an extension of the SRT it will be necessary also to plan for terminal facilities such as commuter parking, an off-street bus terminal and a Kiss'N'Ride drop-off and pick-up. Regardless of the length of the extension or the termination point, the following parcels of land will be required:

Facility	Acreage Required
Bus Terminal (5 bays)	2 acres
Commuter Parking Lot for 1500 vehicles[1] (@400 square feet per vehicle) (includes road, circulation, etc.)	14 acres
Kiss'N'Ride Facility	.5 to 1 acre

Actual yard acreage required will be influenced by site configuration, access requirements, facility layout, etc.

2.3.3 Summary

Between 21.5 and 26 acres of land are required to provide for a storage yard, maintenance facility, bus terminal, commuter parking lot and kiss'n'ride facility. While it is desirable to have the Storage Yard and Maintenance facilities at the same location, it is feasible and possibly desirable to divide the bus terminal, commuter parking and kiss'n'ride facilities between two or more locations depending on RT extension options considered. It is felt that the most logical positioning of facilities for the three RT options under

---

1. A parking lot for 1,500 vehicles has been assumed in order to firstly replace the 550 spaces at McCowan, and secondly provide for expansion to serve an inter-regional function (see Section 2.2.3)

consideration, without undertaking an extensive feasibility study, but based on past experience would be as follows:

Option 2 RT to Finch

- o Maintenance and storage at Finch/Neilson
- o Bus terminal at Sheppard and Finch
- o Park'n'ride at Finch/Neilson and south of Milner (total of 1,500 spaces)
- o Kiss'n'ride at Finch/Neilson and south of Milner

Option 3 RT to Sheppard

- o Maintenance and storage between Milner and Sheppard
- o Bus terminal at Sheppard
- o Park'n'ride at Milner and Sheppard (total of 1,250-1,500 spaces)
- o Kiss'n'ride at Milner (or Sheppard)

Option 4 RT to Milner

- o Maintenance and storage between Milner and Sheppard
- o Bus terminal at Milner (facilities limited due to available space and inconvenience to intercepting bus routes)
- o Park'n'ride at Milner (total of 1,000-1,250 spaces)
- o Kiss'n'ride at Milner

The layouts for options 3 and 4 are discussed further in Section 3.7

It is possible that the maintenance and storage yards could remain at an expanded McCowan site with the purchase of extra property. The question of whether expansion of the McCowan yard or a relocation to another site would be preferable, would require a study in itself and has not been attempted here. A considerable costing exercise would be required at some stage to consider factors such as difference in property costs at alternative sites, feasibility of operating the McCowan yard and RT service while expansion

takes place, life span of existing buildings, and value of existing yards for office development.

2.3.4 Busway Options

Maintenance and storage facilities for the busway options have not been considered as these facilities would generally be required with or without the busways, as buses operating along a busway option would tend to replace services on adjacent routes. However, some proportional costs have been included for garage facilities to allow for the fleet required for the busway options. Significant parking facilities would not be provided in the Milner area as a busway would not likely attract a significant inter-regional market. Limited parking facilities may be justified at Finch Avenue in the Neilson area, but not sufficient to warrant relocating the present parking at McCowan.

2.4 Capital and Operating Costs

2.4.1 Costing of Options

A list of the key assumptions used in the costing analysis is shown in Exhibit 2.7. For each of the RT options it is assumed that new maintenance and storage yards will be built near to the terminals of the extension. A summary of a net cost assessment of the transit service options is shown in Exhibit 2.8. All costs are in 1986 dollars. It should be noted that the capital cost estimates for the RT extension to Finch when compared to the estimates in the Sheppard/Finch RT Study completed in 1985 are considerably higher. The explanation for this is given in Appendix C. In summary, the apparent increase in capital cost is due to the T.T.C. having more experience with the costing of I.C.T.S. lines now that the SRT is completed.

As shown in the costing analysis (see Exhibit 2.8), the Scarborough rapid transit extensions have higher total annualized costs than the busway and bus lane options, principally due to the higher capital costs attributable to the full grade separation necessary for the RT options. The total annualized

EXHIBIT 2.7

Assumptions Used In Cost Assessment of Transit Service Options

Transit Service Options	Demand[1] Peak	Demand[1] Off-Peak	Round Trip Time (Minutes) Peak	Round Trip Time (Minutes) Off-Peak	Average Headway (Minutes) Peak	Average Headway (Minutes) Off-Peak	Vehicle Capacity Peak	Vehicle Capacity Off-Peak	Total Vehicles (includes spares & Maintenance Vehicles)
Scarborough Rapid Transit Extensions									
Option 4 (To Milner)	2900	1000	14	12	2'54"	8'24"	70	38	12
Option 3 (To Sheppard)	2900	1000	21	18	2'54"	8'24"	70	38	16
Option 2 (To Finch)	2900	1000	32	27	2'54"	8'24"	70	38	26
Partial or Full Busway									
Option 5 (To Finch)	2900	1000	36	30	1'14"	3'36"	60	50	32
Option 7 (To Sheppard and reserved bus lanes along Washburn)	2900	1000	34	28	1'14"	3'36"	60	50	30
Reserved Bus Lanes and Busway									
Option 6 - Express buses from City Centre to Malvern using Brimley and Sheppard Avenues, and a busway from Sheppard Avenue to Malvern through Corridor	2900	1000	41	36	1'14"	3'36"	60	50	36

Do Nothing - Option 1

regular bus service improvements.

1. The estimated mature peak hour (a.m.) southbound ridership for the SRT options was 2600 to 2900 (just south of Highway 401 near Progress Avenue). For the costing analysis this ridership has been used in all the transit service options.

EXHIBIT 2.8

SUMMARY OF NET COST ASSESSMENT OF TRANSIT SERVICE OPTIONS
(Millions of 1986 Dollars)

Transit Service Options	Capital Costs[4]					Annualized Operating Costs[5]			
Scarborough Rapid Transit Extensions	Capital Costs Vehicles	Structures	Yards	Total	(A) Annualized[2] Capital Costs	Annual Operating Costs(B)	Annual Revenue From[1] Incremental Ridership(C)	Total Net Annualized Operating Costs (B-C)	Total Annualized Cost(B-C+A)
Option 4. (To Milner)	23.3	140.0	62.0[6]	225.3	13.8	4.0	1.3	2.7	16.5
Option 3. (To Sheppard)	31.5	179.0	72.0[6]	282.5	17.4	4.8	1.3	3.5	20.9
Option 2. (To Finch)	50.4	303.0	77.0[6]	430.4	26.5	8.1	1.3	6.8	33.3
Partial or Full Busway									
Option 5. (To Finch)	5.6	130.0	3.7[7]	139.3	8.6	7.4	-	7.4	16.0
Option 7.[3] (To Sheppard and reserved bus lanes along Washburn)	5.2	115.0	3.4[7]	123.6	7.6	6.4	-	6.4	14.0
Reserved Bus Lanes and Busway									
Option 6 Express buses[3] from City Centre using Brimley and Sheppard Avenues and a busway from Sheppard Ave. to Malvern through corridor	6.3	61.0	4.1[7]	71.4	4.5	7.3	-	7.3	11.8
Do Nothing - Option 1. (regular bus service improvements)									

1. For this calculation it was assumed that the Scarborough RT options would produce 3,157,000 annual net new boardings on the TTC which generates an annual increase in farebox revenue of $1.3 million
2. For this annualized costing analysis the inflation and interest rates are assumed to be 6% and 12%, respectively. As well, the annualization periods for the different capital costs are as follows: buses (18 years); rail vehicles (30 years); and structures and yards (50 years)
3. 40-foot diesel buses are assumed to be used in the bus-related options as their overall total costs are similar to articulated buses.
4. No estimate has been included for property easement costs in any of these options as these costs were not available.
5. The operating costs do not include any savings or additional costs which might result from adjustments to the bus feeder network.
6. Capital costs for SRT yards include non-property costs for bus terminal facilities, Kiss'n'ride and parking facilities.
7. Includes capital costs for garage facilities for buses proportional to number of buses.

costs of the Scarborough rapid transit extensions range from $16.5 million (Option 4 -to Milner Avenue), to $20.9 million (Option 3 - to Sheppard Avenue), to $33.3 million (Option 2 - to Finch Avenue). In comparison, the total annualized costs of the full busway (Option 5 - to Finch Avenue) are $16.0 million, and the total annualized costs of the busway and bus lane combinations are $14.0 million (Option 7) and $11.8 million (Option 6).

However, the total net annualized operating costs of the Scarborough rapid transit extensions are generally lower or comparable to the busway and busway-bus lane options (See Exhibit 2.8). The total net annualized operating costs for the rapid transit extensions range from $2.7 million (Option 4 - Milner Avenue) to $3.5 million (Option 3 - to Sheppard Avenue), to $6.8 million (Option 2 - to Finch Avenue). In contrast, the net total annualized operating costs of the full busway (Option 5 - to Finch Avenue), are $7.4 million, and the same costs for the busway and bus lane combinations are $6.4 million (Option 7) and $7.3 million (Option 6).

A key factor which lowers the total net annualized operating costs of the rapid transit extensions is the new incremental ridership which is assumed would be generated by developments attracted to rapid transit station locations. The new ridership in turn is assumed to provide increased annual farebox revenues of approximately $1.3 million to offset the operating costs of the rapid transit line extensions. However, it is assumed that the bus-related options (Option 5, 6 and 7) would not induce the same level of development along their corridors as with the rapid transit alternatives, and therefore, would not provide new incremental ridership and revenues to the transit system.

2.5 Community Impacts

The planned alignment of the full RT extension to Finch Avenue does not pass through or near a residential community until north of Milner Avenue. If transit service was introduced into the corridor north of Milner, measures would have to be taken to mitigate the impact on the residential

properties that abut the east side. The Corridor itself is fairly wide (approximately 65 metres) south of Sheppard Avenue allowing for some flexibility to locate the line at-grade away from the residential properties with significant buffering and still remain in the Corridor. North of Sheppard Avenue, the Hydro Corridor narrows to 30 metres. The preliminary work carried out by T.T.C. staff indicated that the transit line would be elevated over Sheppard Avenue. In all likelihood, the line would have to remain elevated to north of McLevin Avenue due to the necessary crossings of Mammoth Hall Trail, Greenspire Road and McLevin Avenue. If the RT service was extended in this fashion, there would be significant concern about noise vibration and visual impacts of transit vehicles passing within 20 metres of the houses that back onto the Hydro Corridor.

The other alternative to an elevated line, would be to provide the service underground from south of Sheppard Avenue to north of McLevin Avenue. This would significantly add to the original cost estimate which was based on an elevated service through this section.

North of McLevin Avenue the planned alignment passes north-south through a future park and then proceeds south of and parallel to the C.P. rail line under the bridges at Tapscott and Neilson Roads. The line then crosses over the rail line into the large parcel of land south of Finch Avenue and terminates at this point.

The community park north of McLevin Avenue would, in all likelihood, be bisected by the transit line. Fencing would be required on both sides of the line creating a physical barrier in the park. East of Neilson Road, the line would again run very close to existing residential houses where the vertical elevation of the line must rise to pass over the C.P. rail line.

Exhibit 2.9 contains a list of residential properties that directly abut the Hydro Corridor (i.e. the Malvern Transportation Corridor). Exhibit 2.10 summarizes the number of properties impacted by each transit option.

EXHIBIT 2.9

Residential Properties abuting the Malvern Transportation Corridor

Corridor Section	Street	No. of Properties	Setback(m) Centre Line to Rear of house
McLevin to Sheppard	Shepmore Terrace	33	
	Little Leaf Drive	11	
	Mammoth Hall Drive	39	20
	Sunburst Square	16	
	New development north of Sheppard (off Mammoth Hall Trail)	3	
	Total for Section	102	
Sheppard to Milner	Purvis Crescent	13	55
	Townhouses at east end of Burrows Mall	9	
	Total for Section	22	

EXHIBIT 2.10

Residential Properties Abutting the Malvern Transportation Corridor Impacted by Transit Option

1. Do-Min	2. RT to Finch	3. RT to Sheppard	4. RT to Milner	5. Busway McCowan	6. Busway/ Bus Lanes City Centre to Malvern Centre	7. Busway/ Bus Lanes McCowan to Malvern Centre
0	124	22	0	124	102	22

2.6 Summary

The results of the assessment of the seven future options for service between Malvern and Scarborough City Centre are summarized in Exhibit 2.11.

EXHIBIT 2.11

ASSESSMENT OF OPTIONS

Factor	Option 1. Do-Minimum	Option 2. RT to Finch	Option 3. RT to Sheppard	Option 4. RT to Milner	Option 5. Busway - McCowan to Finch	Option 6. Busway/Bus Lanes - City Centre to Malvern Centre	Option 7. Busway/Bus Lanes - McCowan to Malvern Centre
DEVELOPMENT POTENTIAL	no stimulus to development	would stimulate higher density development at Progress Sheppard/Milner and Malvern Centre	would stimulate higher density development at Progress Sheppard/Milner	would stimulate higher density development at Progress and Milner	stimulus to development minimal	stimulus to development minimal	stimulus to development minimal
Additional tax assessment for Scarborough (annual)	Nil	$42 million	$39 million	$36 million	Minimal	Minimal	Minimal
TRANSIT/SERVICE							
Ridership [1]	Not applicable	2,600-2,900	2,600-2,900	2,600-2,900	2,600-2,900	2,600-2,900	2,600-2,900
Local Service	good penetration of Malvern Community declining bus speeds over time	direct service to Malvern more reliable than bus	indirect service to Malvern	indirect service to Malvern	direct service to Malvern avoiding increasing congestion	direct service to Malvern avoiding increasing congestion	direct service to Malvern avoiding increasing congestion
Inter-Regional Service	no significant inter-regional service	bus and parking facilities at Finch and Sheppard providing an appealing service from the north and east	bus and parking facilities at Sheppard providing an appealing service from the east	bus and parking facilities at Sheppard providing an appealing service from the east	separation from congested roads providing some appeal to divert from auto	separation from congested roads providing some appeal to divert from auto	separation from congested roads providing some appeal to divert from auto

Continued/2

EXHIBIT 2.11 (continued)

ASSESSMENT OF OPTIONS

Factor	Option 1. Do-Minimum	Option 2. RT to Finch	Option 3. RT to Sheppard	Option 4. RT to Milner	Option 5. Busway - McCowan to Finch	Option 6. Busway/Bus Lanes - City Centre to Malvern Centre	Option 7. Busway/Bus Lanes - McCowan to Malvern Centre
MAINTENANCE YARDS AND TERMINAL FACILITIES							
- Storage	Not applicable	Storage required for 60-70 vehicles (7-9 acres) maintenance & storage located at Milner/Sheppard	Storage required for 50-60 vehicles (5-7 acres) maintenance & storage located at Milner/Sheppard	Storage required for 50-60 vehicles (5-7 acres) maintenance & storage located at Milner/Sheppard	Not applicable	Not applicable	Not applicable
- Parking	Not applicable	1,500 spaces at Milner/ Sheppard and Finch	1,250-1,500 spaces at Milner/Sheppard	1,000-1,250 spaces at Milner/Sheppard			
CAPITAL & OPERATING COSTS							
- Capital	Not applicable	$430 million	$283 million	$225 million	$139 million	$71 million	$124 million
- Annual Operating		$8.1 million	$4.8 million	$4.0 million	$7.4 million	$7.3 million	$6.4 million
- Total Annualized Cost		$33.3 million	$20.9 million	$16.5 million	$16.0 million	$11.8 million	$14.0 million
COMMUNITY IMPACTS							
- No.of houses abutting Corridor	0	124	22 [2.]	0	124	102	22 [2.]

NOTES:

1. Maximum peak hour ridership in one direction if Sheppard Subway not built forecast would increase to 2,900-3,100

2. Can be mitigated.

3.0 CONCLUSIONS

3.1 Introduction

Section 2.0 documented the data collected and analysis carried out in assessing the seven transit options considered to serve the Malvern Community. In this section, the assessment will be reviewed and an evaluation carried out of each option to a level sufficient to facilitate a decision on whether the corridor should be protected at all and if so, for what length.

The evaluation was done in three stages; firstly, a comparison of the three rapid transit options, followed by a comparison of the three busway options and then discussion of the implications to corridor protection of the preferred options.

3.2 Comparison of RT Options

As far as development potential is concerned, all three options would provide the stimulus for office development which would produce additional employment potential of between 22,000 and 26,000 jobs. The option to Finch would be the preferred option as far as **development potential** is concerned and the Milner option the least preferred, however, the margin of difference between the three options is not great. The 4,000 extra jobs thought achievable at the Malvern Centre (if the RT is extended to Finch, i.e. Option 2) are not so critical (and are not likely to materialize) if an extension is not proceeded with relatively soon, as near term pressure will likely force development of the centre to a lower density and/or different land use.

As far as **transit service** for the Malvern Community is concerned, given the generally low density residential nature of the area, the RT extension would improve access for a relatively small proportion of the community due to the nature of rapid transit (i.e. wide spacing of stops).

Bus service is the more appropriate type of service for a low density residential area offering direct street access. Of the three RT options, Option 2 to Finch would offer some improvement in service to Malvern while

Options 3 and 4 would offer little or no service advantage over the current bus routes. As far as satisfying an inter-regional role, all three RT options, with parking facilities at Milner, would fulfill the role. Again option 2 would be slightly preferred because of better future service to and from Markham and north Pickering.

Option 2, RT to Finch, would provide the most flexibility for providing the required storage and **maintenance yard and terminal facilities.** Options 3 and 4 are dependent on the ability to utilize substantial blocks of vacant land from the Federal Government and Roridan (the land owner south of Milner Avenue). In this regard, however, it should be noted that both land owners require zoning approvals from the City of Scarborough to proceed with any additional development. Preliminary discussions have been held with representatives of the Scarborough Planning Department, Roridan and the Federal Government and the proposals illustrated received preliminary support.

Option 2, ($430 million) would be approximately twice the **capital cost** to construct and equip as option 4 ($225 million), while option 3 ($282 million) is slightly more than option 4. A similar comparison can be seen for operating cost and hence **net annualized cost** ($33 million for Option 2; $21 million for Option 3 and $17 million for Option 4).

For **community impact,** option 2 to Finch would be the option that by far would have the most negative impact (i.e. north of Sheppard) and hence potential public opposition. The other two options would have little impact or alternatively the impacts could be mitigated relatively easily.

3.3 Preferred RT Options

Exhibit 3.1 gives a summary evaluation of the three RT options. Option 2, RT to Finch, although having marginal advantages over the other two regarding development potential and service, has a much greater capital

EXHIBIT 3.1

SUMMARY EVALUATION OF RT OPTIONS

FACTOR	OPTION #2 RT TO FINCH	OPTION #3 RT TO SHEPPARD	OPTION #4 RT TO MILNER
Development Potential	26,000 jobs[1] Good (1)	24,000 jobs Good (2)	22,000 jobs Good (3)
Service: Local	Small improvement(1)	Little or no improvement (2)	Little or no improvement (3)
Inter-Regional	Good bus and park'n' ride access from N and E (1)	Good bus and park'n' ride access from E only (2)	Good park'n'ride from E only (3)
Terminal Facilities	Good (1) Flexibility	Good (2) (subject to availability of Federal Lands)	Good (3) (subject to availability of Federal Lands)
Capital Costs	$430 million (3)	$282 million (2)	$225 million (1)
Annual Operating Costs	$8.1 million (3)	$4.8 million (2)	$4.0 million (1)
Total Annualized Cost	$33.3 million (3)	$20.9 million (2)	$16.5 million (1)
Community Impacts	124 residences (3) High (3)	22 residences[2] (2) Medium (2)	0 residences (1) Low (1)

A ranking of the options for each factor is shown in brackets.

Notes:

1. Only if RT extension undertaken soon, otherwise 22,000 extra jobs is more realistic

2. Impacts can be mitigated.

cost and impact on adjacent land use. It is the conclusion of the study team that these marginal advantages are not worth a close to doubling of capital costs, and the much greater impacts on adjacent residential development. In reality, the costs would increase further if the community impacts were mitigated against by going underground where it passes between houses north of Sheppard Avenue. Option 2 to Finch has therefore been eliminated from further consideration. A consequence of eliminating this option is that a longer term option to extend the line further north and east of Finch Avenue is lost. However, the development being considered north and east of Finch is generally low density residential development. The only major traffic generator in the area is the Metropolitan Zoo. The Zoo is primarily an off-peak auto dependent generator, for which service by bus will always be adequate. An option to extend the RT beyond Malvern is therefore not worth protecting.

This leaves Options 3 and 4, the Sheppard and Milner options. Option 3 to Sheppard would have a slight advantage for service to the north and for development potential in the Sheppard/Markham area; the terminal facility requirements for both options are virtually the same and the community impacts would be similar if, north of Milner Avenue, the alignment of the Sheppard option was realigned away from the existing residential neighbourhood adjacent to the Hydro corridor. A trade-off could then be considered between the development and service advantages of the Sheppard option against the extra capital costs ($57.2million) and extra annual operating costs ($0.8 million) for the slightly longer line. This would require analysis that would demand more detail than can be considered in the time frame available for this study. In particular, the feasibility of expanding the McCowan Yard and the trade-off against relocating to another site would be an important factor that could effect the cost/development potential trade-off. In summary, the RT options to Sheppard and Milner should both be protected for further consideration at such time as a decision to extend the RT line is required.

3.4 Comparison of Busway Options

The **development potential** along busway corridors is not well documented. While it is understood that Ottawa has had some limited success in this regard, it was felt that in this Corridor the development potential associated with implementation of a busway would be minimal. Certainly the difference between the three options is not considered significant.

Service/Ridership to the Malvern Community was felt to be only marginally different between the three options. None of the three options were considered to provide an adequate inter-regional service capability (i.e. 'Gateway') and to attract significant numbers to transit.

Provision of **terminal facilities** is a factor which is not significantly different among the three busway options.

Option 6, Busway/Bus Lanes-City Centre to Malvern Centre, is significantly cheaper ($71 million) than options 7 ($124 million) and 5 ($139 million) for **capital costs** and similarly so for **operating costs.** Option 6 however, and option 5 would have significant **community impacts** along the Hydro Corridor north of Sheppard.

3.5 Preferred Busway Options

Exhibit 3.2 shows a summary evaluation of the busway options. Development potential, Service/Ridership and terminal facilities are clearly not decision making factors for these options.

Options 5 and 6 would not be preferred because of the significantly greater community impacts. Options 5 and 7 would not be preferred because of the higher costs. This would appear to exclude option 5 from further consideration and leave options 6 and 7 for further consideration.

The high impacts of option 6 are due to the use of the Malvern Corridor between Sheppard and the Malvern Centre. However, using Tapscott and

EXHIBIT 3.2

EVALUATION OF BUSWAY OPTIONS

FACTOR	Option #5 McCOWAN TO FINCH	Option #6 CITY CENTRE TO MALVERN CENTRE	Option #7 McCOWAN TO MALVERN CENTRE
Development Potential	Minimal	Minimal	Minimal
Service: Local	small improvement	small improvement	small improvement
Inter-Regional	Poor	Poor	Poor
Capital costs	$139 million (3)	$71 million (1)	$124 million (2)
Annual Operating Costs	$7.4 million (3)	$7.3 million (1)	$6.4 million (2)
Total Annualized Cost	$16.0 million (3)	$11.8 million (1)	$14.0 million (2)
Community Impacts	124 residences High (3)	102 residences High (2)	22 residences Medium (1)

A ranking of the options for each factor is shown in brackets.

Washburn instead of the designated Corridor, would offer roughly an equal travel time (partly due to lack of traffic 'friction' because of reverse frontages along Washburn) and additionally would serve the residential area more directly. This led to the adoption of a modified version of option 6, which did not use any part of the Malvern Corridor. The route would be from Finch, along Tapscott and Washburn to Sheppard, along Sheppard to Brimley and along Brimley to Scarborough City Centre. The route would involve the use of exclusive bus lanes where necessary. This modified option 6 is now the same as option 7 north of Sheppard, while the section south of Sheppard provides a logical choice (i.e. an interim, less expensive option) to the more expensive option of providing a busway in the Malvern Corridor south of Sheppard. Implementation of the latter would only be considered when the City Centre road system becomes congested enough to warrant it.

Two busway options (modified 6 and 7) are therefore carried forward for further consideration with option 7 being a logical ultimate configuration. In either case, use of the Malvern Corridor north of Sheppard would not be required.

3.6 The Choice Between Busway, RT and Do-Minimum

If the do-minimum option were selected and interest in the Malvern Corridor was released, development potential for Scarborough and also enhancement of traffic operations in the City Centre provided by an extension of the RT would be lost. Further, no inter-regional facility or 'Gateway' could be provided since additional inter-regional traffic destined to the City Centre to access the RT would not be desirable. These two factors are not pressing priorities at present. However, in the future they could well be, and the option for satisfying these two aims is worth keeping.

The busway option while not satisfying the development potential or inter-regional transit factors nevertheless is a third option, one that would offer a more reliable bus service between the City Centre and the Malvern community than buses operating in mixed traffic.

In summary, it is therefore felt desirable to protect for the following options which involve use of the Corridor south of Sheppard Avenue:

Option No.7	busway to Sheppard Avenue;
Option No.4	RT to Milner Avenue; and
Option No.3	RT to Sheppard Avenue.

Protection of the Corridor south of Sheppard would also allow the Ministry of Transportation and Communications to utilize the Corridor south of Highway 401 for an inter-regional transit service linking the Region of Durham to the Scarborough City Centre.

3.7 Implications of Conclusions to Corridor Protection

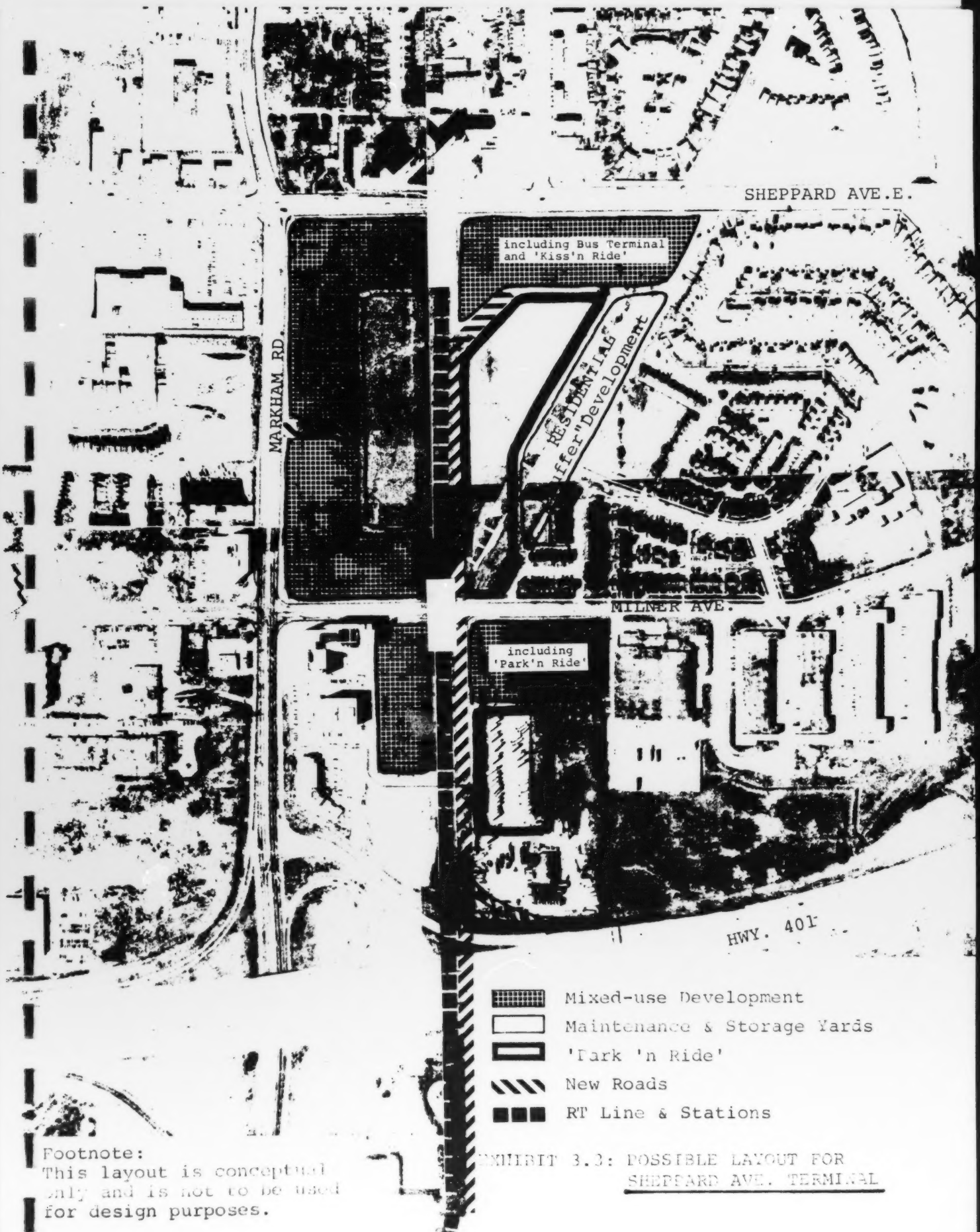
This study will not be making any firm recommendations regarding the timing of construction of a preferred option, either RT or busway, thus effectively leaving the 'do-minimum' option in operation at present. Passenger demand will not drive the construction of the RT extension; it is more likely to be a combination of the benefits of additional development around the Malvern Corridor, relief to the City Centre road system and, the accommodation of inter-regional transit needs through the implementation of a 'Gateway'.

It is then more important to assess the implications of protecting the necessary right-of-way for the preferred RT and busway options. Firstly, for both options, Metro's interest in the Hydro right-of-way north of Sheppard can be released and Ontario Hydro would be free to sell these lands. If the RT extension is terminated at Sheppard Avenue or Milner Avenue, it is imperative that property requirements be protected or bought along the corridor south of Sheppard Avenue. As previously discussed in Section 2.3.3 the decision as to whether expansion of the McCowan Yards would be more desirable than relocation, cannot be addressed in sufficient detail in this study. It is therefore essential that allowance be made for relocation of these facilities to the terminus of the Milner and Sheppard options. To this

end, preliminary drawings were made of possible (but not necessarily preferred) layouts. These are shown in Exhibits 3.3, 3.4 and 3.5. For all options the use of the Federal lands between Milner and Sheppard is required for the yard facilities and some parking. Bus and kiss'n'ride facilities and some parking could however be incorporated into the adjacent development. This approach reduces the total amount of land required and hence the areas to be protected and/or bought and further, it also maximizes the amount of development possible in the adjacent areas. An essential element in these layouts is the direct access provided from Highway 401 to and from the east, together with the extension of Progress Court across Highway 401. Preliminary discussions have been held with the M.T.C. Central Region staff to assess the feasibility of this configuration. An initial reaction was that it is physically possible, but would likely compromise current highway design standards. M.T.C. Central Region staff have suggested an alternative option for the west bound off ramp to Progress Court which would provide a better standard of weaving length between this ramp and the Highway 401/Neilson Road westbound on-ramp. More detailed study would be required at some point in the future to arrive at a solution satisfactory to the M.T.C.

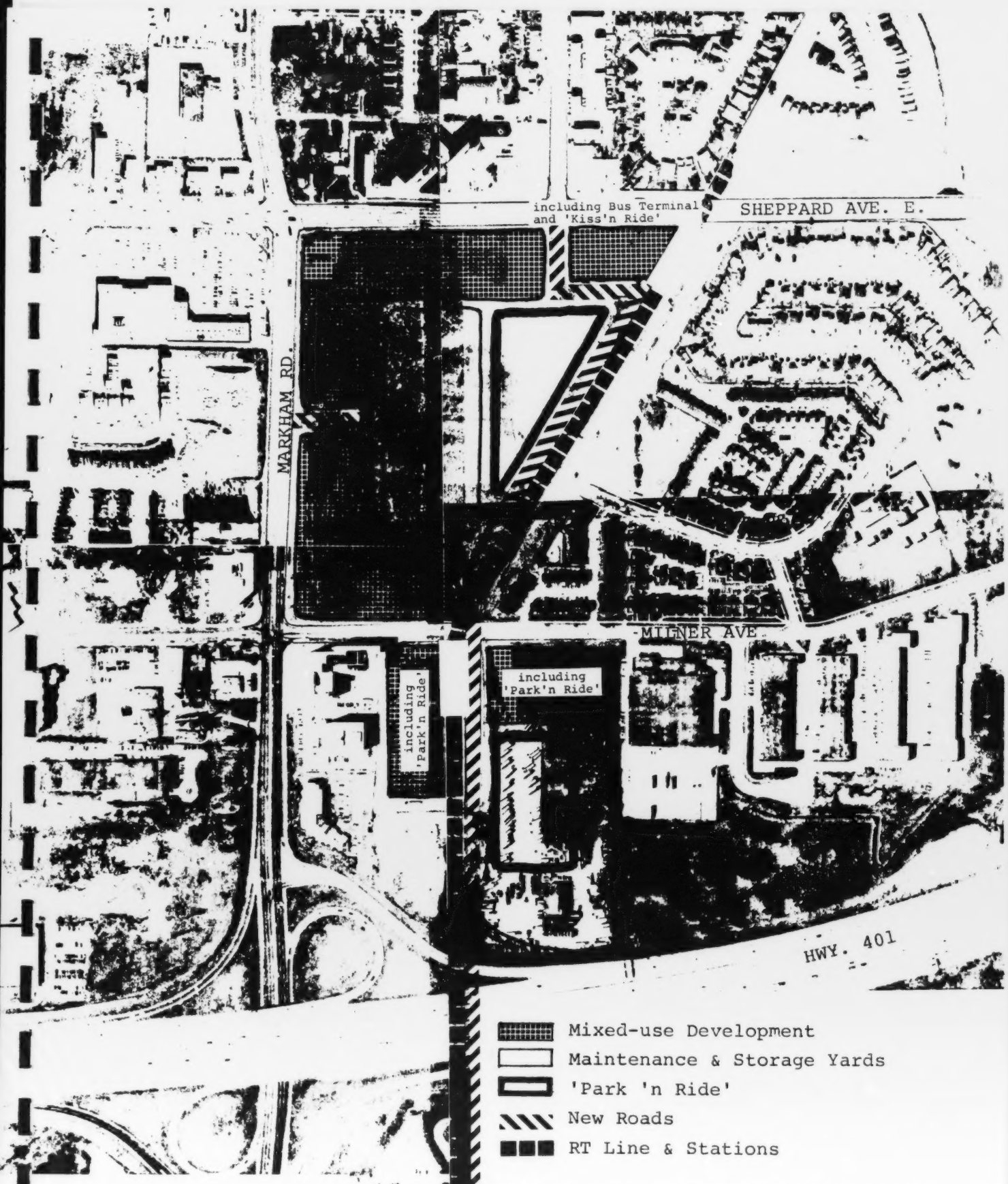
Exhibits 3.3 and 3.5 show the Hydro Corridor south of Sheppard not being used for the RT, but instead as a 'buffer' area between the existing residential development and the maintenance and storage yards. It was felt the best terminus for the Sheppard option would be achieved by continuing north of Milner and parallel to Markham Road rather than using the Hydro Corridor (as shown in Exhibit 3.3) because of the following reasons:

1. better opportunity to maximize the proximity of new development (and therefore jobs) to the future Sheppard RT station;
2. reduced impacts to the adjacent residential properties;
3. a better interface for surface transit routes (i.e. closer to the Markham/Sheppard intersection); and
4. slightly shorter length of track required, and hence cheaper;



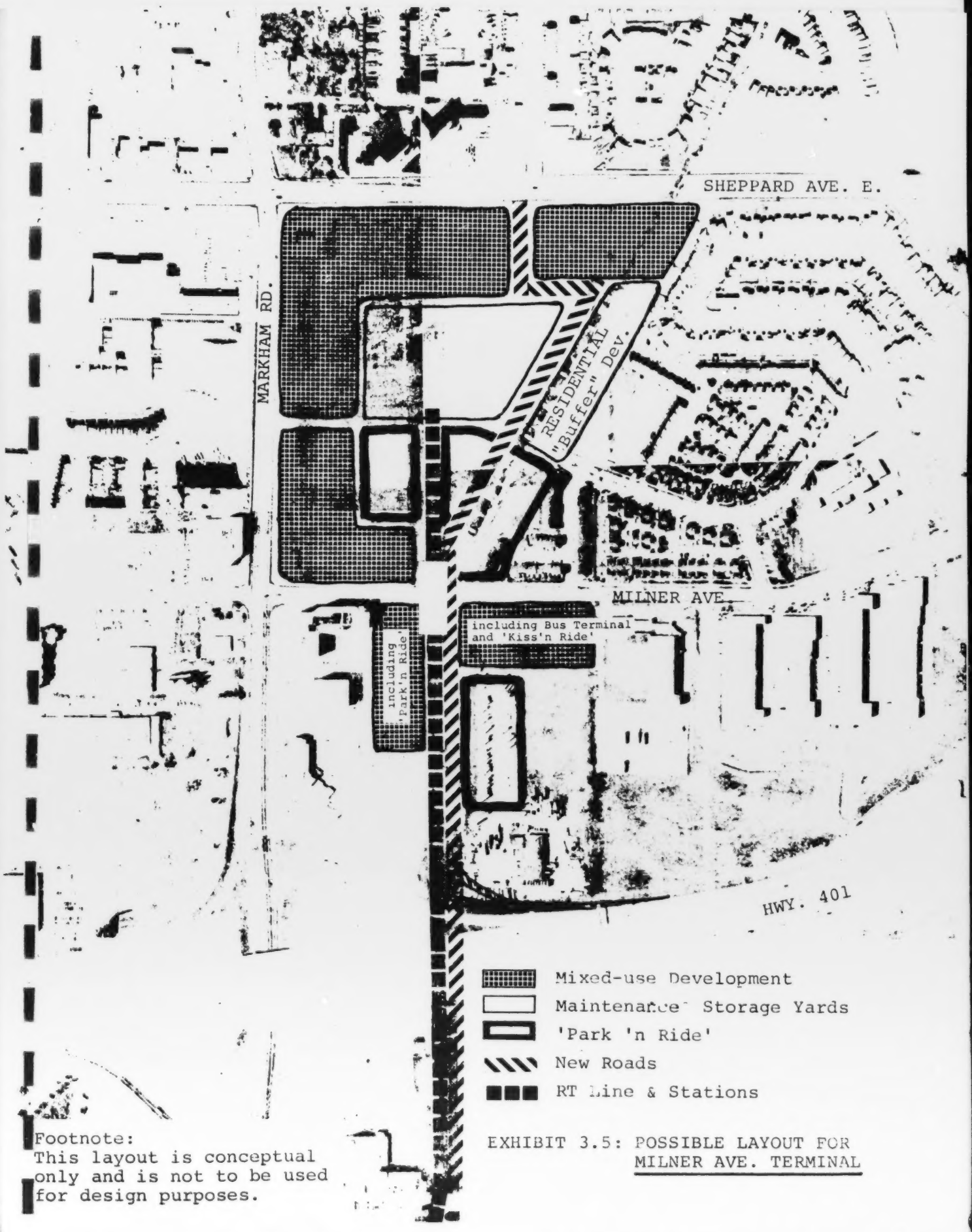
Footnote:
This layout is conceptual only and is not to be used for design purposes.

EXHIBIT 3.3: POSSIBLE LAYOUT FOR SHEPPARD AVE. TERMINAL



Footnote:
This layout is conceptual only and is not to be used for design purposes.

EXHIBIT 3.4: ALTERNATIVE LAYOUT FOR SHEPPARD AVE. TERMINAL



Footnote:
This layout is conceptual only and is not to be used for design purposes.

EXHIBIT 3.5: POSSIBLE LAYOUT FOR MILNER AVE. TERMINAL

Despite the above conclusion, the study team have concluded that the acquisition of the Hydro Corridor south of Sheppard is warranted. The reasoning is summarized below:

- o the option to use part of this corridor for either the RT extension, the busway or related terminal facilities is retained;
- o if Hydro lands are purchased, greater control over development can be exerted and the concept of providing a 'buffer' to the existing adjacent residential development is retained; and
- o retention of the Hydro Corridor allows a future exchange of land for the main terminal facilities which would be located on Federal Lands.

The study team therefore concludes that purchase of the Hydro Lands between Milner and Sheppard Avenue to provide the flexibility as outlined above is worth the approximately $1.5 million that the 8.41 acres of land will cost. It should be noted that the value of the land is likely to increase over time making it a good investment for the Metropolitan Corporation.

The results of purchasing the Hydro lands would mean that Metro would own approximately 24% of the Corridor. Of the remaining 76%, approximately three quarters is in public ownership and one quarter in private ownership (in the vicinity of Markham Road).

3.8 Summary of Conclusions

This study has addressed the immediate concerns of protection of the Malvern Transportation Corridor and provided clarification on the future possibilities for transit service to the Malvern community.

The study has reaffirmed previous investigations which found the future passenger demand to be low and not sufficient in itself to demand an early consideration for construction of an SRT extension. The timing of

construction, which will be driven more by the demands of development, the need to relieve City Centre roads and possibly inter-regional travel considerations, will have to be considered further at some time in the future.

In the meantime the Malvern Community can be more than adequately served by buses, later using reserved bus lanes as required and in the longer term future, a busway in the Malvern Transportation Corridor south of Sheppard. The study team therefore concludes the following to be an appropriate course of action:

1. amend the Metropolitan and Scarborough Official Plans to show a revised Malvern Transportation Corridor terminating at Sheppard Avenue; and

2. The Metropolitan Corporation exercise the Option to Purchase agreement with Ontario Hydro by agreeing to purchase the Hydro lands south of Sheppard Avenue and to release its interest in the lands north of Sheppard Avenue.

There are other factors which arose in this study which will again require further consideration at a later date. It is worthwhile then, along with the above conclusions, to recommend courses of further action to protect Metro's interest in the remaining corridor and resolve certain issues. The following studies should therefore be undertaken prior to any decision to extend the SRT.

1. A comprehensive study (to be co-ordinated by the T.T.C.) to examine the feasibility and desirability of expanding the McCowan Yard to accommodate an extended SRT;

2. Further study by Scarborough and negotiation with the Ministry of Transportation and Communications to establish a suitable design for direct access to Highway 401 to and from the east for an extension of Progress Court across Highway 401;

3. After studies 1 and 2 above are completed, a detailed land use study of the Federal Government and Roridan lands. Such study should be undertaken by Scarborough in consultation with Metropolitan staff and should include a traffic impact analysis to determine the appropriate level and type of development in order to establish the appropriate Official Plan and zoning amendments; and

4. A study to be undertaken by Scarborough in consultation with Metropolitan staff to determine the appropriate level of development in the Progress Industrial East District, assuming an SRT extension; again such study to include a traffic impact analysis.

APPENDICES

APPENDIX A.

CALCULATION OF ASSESSMENT VALUES

The Total Assessment per m^2 for office development and the kind of industrial development that could be anticipated in the Progress Industrial area was estimated from a small sample of existing developments for each type:

Office Development

I. 2100 Ellesmere and 1200 Markham
II. 1940 Eglinton at Warden
III. 2901 Kennedy at Trojan Gate.

Industrial Development

I. 3447 Kennedy
II. 670-710 Progress
III. 11-31 Progress

Summary of Results (1985 Assessment for 1986 Taxes)

Case #	Floorspace (sq.m.)	Realty Assessment	Business Assessment	Total Assessment
Office Development				
I.	17,000	1,687,660	426,325	2,113,895
II.	6,970	703,000	341,805	1,044,805
III.	2,790	182,150	81,320	263,470
TOTAL	26,760	2,572,810	849,360	3,422,170
$/sq.m.		96	72	128
Industrial Development				
I.	7,450	423,495	163,005	586,500
II.	22,500	1,111,140	472,105	1,583,245
III.	20,000	830,790	384,045	1,214,835
TOTAL	49,950	2,365,425	1,019,155	3,384,580
$/sq.m.		47	20	68

APPENDIX B

KEY ASSUMPTIONS FOR RIDERSHIP FORECASTS

- 2011 population and employment projections (for 21 sub-areas within the corridor) were used as documented in section 2.1 of this report;

- Employed labour force projections were based on Metro Toronto Planning Department's Traffic Zone Data Bank and Model;

- A Sheppard Subway to Scarborough City Centre was assumed to be in service by 2011;

- Additional cross-boundary T.T.C. services into Markham were assumed to be in operation by 2011. The only cross-boundary service expected to feed the SRT extension would be the Markham Road (102) service. Additional cross-boundary services were assumed to feed directly into Scarborough City Centre, thereby not affecting the RT extension;

- Existing T.T.C. SRT feeder bus routes were assumed to be modified to feed the extended SRT.

- SRT ridership is expected to increase from the addition of a 1,500 car commuter parking lot in the vicinity of Markham Road and Milner Avenue (which was assumed to replace the existing McCowan Station commuter parking lot). For ridership forecasting purposes, the new lot was assumed to operate at full capacity;

- Increases in kiss'n'ride commuter ridership from outside Metro were assumed to be negligible;

- Daily net new boardings were estimated based on those projected 2011 employment increases in the Malvern area, which are assumed to occur only if the RT is extended (see section 2.1), and on increased commuter parking lot usage. These are the primary sources of new riders to the system which would be directly attributable to the SRT extension.

APPENDIX C

CAPITAL COST ESTIMATES FOR

SRT EXTENSION TO FINCH AVENUE

An explanation for the capital construction (yards and structures) cost difference between the Network 2011 Study estimate and the Malvern Study estimate for the SRT extension to Finch Avenue is outlined below:

Network 2011 Study Estimate (includes structures and yards) = $210 million (1984$)

Malvern Transportation Corridor Study Estimate (includes structures and yards) = $380 million (1986$)

Factors include:

(i) inclusion of an escalation factor between 1984 and 1986 at 5% per year $21.5 million.

(ii) inclusion of a factor for general overhead costs $8.7 million.

(iii) inclusion of a factor for potential changes in orders and claims $22.7 million.

(iv) modified contingency factor (25%) was used in Malvern Study whereas a 20% contingency factor was used in the Network 2011 Study $15.2 million.

(v) inclusion of increased engineering costs $23.0 million.

(vi) inclusion of increased cost for elevated stations $6.5 million.

(vii) inclusion of costs for McCowan yard modifications to enable line to go through yards $7 million.

(viii) inclusion of costs for 60-70 vehicle yard (Malvern Study) versus a 50 vehicle yard (Network 2011 Study) $20 million.

(ix) inclusion of costs for special structures for stations due to profile $3 million.

(x) inclusion of costs for (1,500 spaces) parking lot and park-n-ride facilities
$3 million.

(xi) provision of costs for pedestrian access off Neilson Road bridge to Neilson Station
$2.5 million.

(xii) inclusion of additional costs for relocation of overhead utilities at stations
$2 million.

(xiii) inclusion of increased costs for elevated structures (not including stations)
$9.6 million.

(xiv) inclusion of increased costs for relocation of utility services
$3 million

(xv) provision for costs for 2 control areas in each station (1 automatic and 1 manual) versus 1 control area in Network 2011 estimate
$14.8 million.

(xvi) inclusion of higher costs for rail installation on guideway
$6 million.

(xvii) inclusion of costs for an additional storage track structure
$1.5 million.

Total Difference $170 million

(i)	21.5
(ii)	8.7
(iii)	22.7
(iv)	15.2
(v)	23.0
(vi)	6.5
(vii)	7.0
(viii)	20.0
(ix)	3.0
(x)	3.0
(xi)	2.5
(xii)	2.0
(xiii)	9.6
(xiv)	3.0
(xv)	14.8
(xvi)	6.0
(xvii)	1.5

N.B. This cost comparison excludes the cost of vehicles.